Nuclear Data Sheets for A = 26^{*}

M.S. Basunia and A.M. Hurst

*Nuclear Science Division
Lawrence Berkeley National Laboratory
MS 88R0192
1 Cyclotron Road
Berkeley, California 94720*

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Abstract: Evaluated spectroscopic data and level schemes from radioactive decay and nuclear reaction studies are presented for ²⁶O, ²⁶F, ²⁶Ne, ²⁶Na, ²⁶Mg, ²⁶Al, ²⁶Si, ²⁶P, and ²⁶S. This evaluation for A=26 supersedes the earlier one by P. M. Endt (1998En04) and updates for some nuclides in ENSDF.

Highlights of this evaluation are the following:

This evaluation includes search results for ²⁶S nuclide and its proton-decay mode (2011Fo08).

An isomeric state (2.2 ms) in ²⁶F has been discovered by 2013Le03. The state is proposed at 643.4 keV *1* from γ -ray measurements. Internal-transition and beta-decay branches for the state are also determined. New excited levels in ²⁶Ne have been identified from ²⁶F β^- decay (2.2 ms).

For some ²⁶Si resonance states conflicting spin-parity assignments exist in the literature. These are identified by footnotes. 2015Do07 (³He,n γ) propose the first 0+ state above proton separation energy at an excitation energy of 5890 keV and suggested for additional independent measurements to confirm or refute the existence of 5946 keV *4*. 2016Ch09 consider 5946 keV level as a distinct excited state in their reanalysis of the literature data with possible spin-parity assignment of 0+ or 4+

This evaluation also includes discovery of an isomeric state, at 164.1 keV *1*, in ²⁶P by 2014NiZZ.

Cutoff Date: All data received by February 1, 2016 have been evaluated. The NSR database (2014Pr09) (www.nndc.bnl.gov/nsr/) is the primary source for the bibliography.

General Policies and Organization of Material: see <http://www.nndc.bnl.gov/nds/NDSPolicies.pdf>.

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General Comments: The internal conversion coefficients (α) presented in this evaluation have been calculated using the computer code BrIcc (2008Ki07) based on Band-Raman tables of conversion coefficients. The Limitation of Relative Statistical Weight (LWM) averaging method (1985ZiZY) has been used for some discrepant data sets in this evaluation.

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Skeleton Scheme for A=26

Skeleton Scheme for A=26 (continued)

Ground-State and Isomeric-Level Properties					
Nuclide	Level	J π	T _{1/2}	Decay Modes	
^{26}O	0.0	0+	4.5 ps +32-34		
^{26}F	0.0	1+	8.2 ms 9	% β^- =100; % β^- n=13.5 40	
	643.4	(4+)	2.2 ms 1	%IT=82 11; % β^- =18 11; % β^- n=12 8	
^{26}Ne	0.0	0+	197 ms 2	% β^- =100; % β^- n=0.13 3	
^{26}Na	0.0	3+	1.07128 s 25	% β^- =100	
^{26}Mg	0.0	0+	stable		
^{26}Al	0.0	5+	7.17×10^5 y 24	% ϵ +% β^+ =100	
	228.305	0+	6.3460 s 8	% ϵ +% β^+ =100	
^{26}Si	0.0	0+	2.2453 s 7	% ϵ +% β^+ =100	
^{26}P	0.0	(3)+	43.7 ms 6	% ϵ +% β^+ =100; % ϵ p=36.8 20; % ϵ 2p=2.16 24; % $\epsilon\alpha$ =0	
^{26}S	0.0	0+	<79 ns	%p=?	
^{27}Na	0.0	5/2+	301 ms 6	% β^- n=0.13 4; ...	
^{27}P	0.0	1/2+	260 ms 80	% β^+ p=0.0700; ...	
^{27}S	0.0	(5/2+)	15.5 ms 15	% β^+ p=2.3 9; ...	
^{30}Na	0.0	2+	48 ms 2	% β^- α = 5.5×10^{-5} 2; ...	

Adopted Levels

Q(β^-)=16070 170; S(n)=690 110; S(p)=28540 SY; Q(α)=-2.13 $\times 10^4$ 3 2012Wa38.
 $\Delta S(p)$ =530 (syst) (2012Wa38).
 S(2n)=-90 110 (2012Wa38).
 1990Gu02: Nonexistence determined in Ta(^{48}Ca ,X) by 1990Gu02.
 1996Fa01: $^9\text{Be}(^{40}\text{Ar},\text{X})$, E=90 MeV/nucleon; Several hundred events expected, none observed (1996Fa01).
 2000Oz01: $^9\text{Be}(^{40}\text{Ar},\text{X})$, E ~1 GeV/nucleon; Confirm particle instability.
 2004Lu19: Ta($^{40}\text{Ar},\text{X})$, E=90.1 MeV/nucleon; No evidence was found.
 2005Sc20: C($^{27}\text{F},\text{x}$), E=90 MeV/nucleon; No evidence of ^{26}O .

 ^{26}O Levels**Cross Reference (XREF) Flags**A $^9\text{Be}(^{27}\text{F},^{26}\text{O})$, C($^{27}\text{F},^{26}\text{O}$)

E(level)	J π	XREF	T $_{1/2}$	Comments
0.0	0+	A	4.5 ps +32-34	%2n=100. E(level): 2016Ko11 deduced g.s. of ^{26}O as unstable to 2-neutron emission, with an adopted resonance value of 18 keV 10 (stat) 4 (syst). from their measurements. T $_{1/2}$: From 2013Ko10. Half-life of 4.5 ps +11-15 (stat) 30 (syst) is deduced at 82% confidence level, suggesting the possibility of two-neutron radioactive decay. Evaluators added the uncertainties in quadrature. Other values: ≤ 4.0 ns, from mean lifetime of $\tau \leq 5.7$ ns (2013Ca18) at 95% C.L.; < 10 fs (2013Th04).
1277 96	(2+)	A		J π : 2016Ko11 propose as the first excited state of ^{26}O . E(level): From E $_{\text{res}}$ =1280 keV +110-80 (2016Ko11 list as 1.28 MeV +11-8). Compiler used E $_{\text{res}}$ =1295 keV 95, with symmetric uncertainty, to deduce the excited level energy. FWHM 540 keV at 1300 keV.
2000?†		A		E(level): From 2013Ko10, resonance energy at approximately 2 MeV. Note that position of this state in Figure 1 of 2013Ko10 is based on predictions from the continuum shell model calculations.
4230† 200		A		E(level): Deduced by evaluator from measured E $_f$ =4225 keV +227-176 (2013Ca18) and considering E $_f$ =18 keV 10 (stat) 4 (syst) for g.s. Evaluator used E $_{\text{res}}$ =4250 keV 200, with symmetric uncertainty, to deduce the excited level energy.

† 2016Ko11 note that no resonance like structure at higher energies reported by 2013Ca18 was observed.

 $^9\text{Be}(^{27}\text{F},^{26}\text{O})$, C($^{27}\text{F},^{26}\text{O}$) 2016Ko11,2013Ko10,2013Ca18

Others: 2015Ko08, 2013Th04, 2012Lu07.

2016Ko11: ^{27}F beam was produced by fragmentation of ^{48}Ca primary beam, E=345 MeV/nucleon, on a Be target at the RIKEN Nishina Center and Center for Nuclear Study, University of Tokyo. The fragments were separated by BigRIPS separator and ^{27}F secondary beam bombarded a C (thickness 1.8 g/cm 2) target with mean energies of 201-MeV/nucleon (mid target). The impact position on the target and incident angles of beam particles determined event by event using two multiwire drift chambers (MWDCs). The decay products, ^{24}O and two neutrons were measured in coincidence using a magnetic spectrometer, SAMURAI, for momentum analysis of charged particles and by plastic scintillator array, NEBULA, consists of 120 detector modules and 24 charged particle veto detectors, respectively. The trajectories of the charged fragments were determined using two MWDCs and a 16 element plastic scintillator hodoscope was used for energy loss and time-of-flight measurements. ^{26}O decay-energy spectrum from one-proton removal of ^{27}F reconstructed from momentum vectors of ^{24}O and two neutrons. Deduced g.s. and first excited state of ^{26}O using invariant-mass spectroscopy.

2013Ko10,2012Lu07,2015Ko08: $^9\text{Be}(^{27}\text{F},^{26}\text{O}) - \text{E}(^{27}\text{F})=82$ MeV/nucleon beam obtained from fragmentation of ^{48}Ca beam, E=140 MeV/nucleon, with a 1316 mg/cm 2 thick ^9Be target. ^{27}F fragments separated by A1900 fragment separator. Secondary reaction target was 705 mg/cm 2 thick ^9Be . The ^{26}O to $^{24}\text{O}+\text{n}+\text{n}$ decay was investigated through the identification of charged particles in mass, charge, kinetic energy, and angle by a 4 Tm dipole magnet, and detection of neutrons by MoNA array placed 6.05 m from the reaction target. Measured E(n), I(n), (^{24}O)nn-triple coin; deduced decay energy spectrum and half-life of ^{26}O decay from the analysis of three-body decay energy of $^{24}\text{O}+\text{n}+\text{n}$ system, and detailed Monte-Carlo simulations. The invariant mass of ^{26}O was extracted from the experimentally measured four-momenta of the ^{24}O and two neutrons. Comparison with theoretical predictions.

Continued on next page (footnotes at end of table)

$^9\text{Be}(^{27}\text{F}, ^{26}\text{O}), \text{C}(^{27}\text{F}, ^{26}\text{O})$ 2016Ko11,2013Ko10,2013Ca18 (continued)

2013Ca18: $\text{C}(^{27}\text{F}, ^{26}\text{O}) - ^{27}\text{f}$ beam, $E=414\text{--MeV/nucleon}$, produced via fragmentation of a $490\text{--MeV/nucleon } ^{40}\text{Ar}$ primary beam in a 4 g/cm^2 Be target using the R3B-LAND reaction setup at GSI. Neutron-unbound states in ^{26}O were populated via one-proton knockout of ^{27}F on different secondary targets: $922\text{ mg/cm}^2 \text{CH}_2$, $935\text{ mg/cm}^2 \text{C}$, and $2145\text{ mg/cm}^2 \text{Pb}$. The secondary target was surrounded by the 4π Crystal Ball detector comprising 160 NaI elements for photon and light-particle detection. Energy-loss and position measurements for charged beam particles accomplished using two silicon-strip detectors behind the target. Ions identified through time of flight and energy-loss measurements. Neutrons detected 12 m downstream of the target using the LAND neutron detector with 92% single-neutron efficiency. Deduced unbound states of ^{26}O and mean lifetime.

 ^{26}O Levels

E(level)	$J\pi$	$T_{1/2}$	Comments
0.0	0+	4.5 ps +32-34	<p>%2n=100.</p> <p>E(level): 2016Ko11 deduced g.s. of ^{26}O as unstable to 2-neutron emission, with an adopted resonance value of 18 keV 10 (stat) 4 (syst). from their measurements. Considering different modes of decay and assumptions, 2016Ko11 deduced resonance energy values of 22 keV +14-11, 18 keV 3 (stat), 19 keV 3 (stat), 17 keV 3 (stat), 19 keV +3-4 and conclude that the resonance energy (g.s.) is model independent. FWHM 110 keV at 20 keV (2016Ko11). 2013Ca18 deduced g.s. of ^{26}O as unstable to 2-neutron emission, with measured resonance energy of $\leq 120\text{ keV}$ at 95% C.L. and $\leq 40\text{ keV}$ at 68% C.L. 2015Ko08 extracted an upper limit at 1σ of 53 keV for the ground-state resonance energy of ^{26}O from simultaneous and self-consistent fitting of the experimental decay energy and the Jacobi three-body correlation variables. Their earlier value $150 +50-150$ (2012Lu07) was deduced from fit of the experimental three-body decay spectrum with a Monte Carlo simulation including the decay from the ground state and first excited state.</p> <p>$T_{1/2}$: From 2013Ko10. Half-life of 4.5 ps +11-15 (stat) 30 (syst) is deduced at 82% confidence level, suggesting the possibility of two-neutron radioactive decay. Evaluators added the uncertainties in quadrature. In 2013Ko10, fitting of relative velocity distribution of ^{24}O and each of the two neutrons with a Monte Carlo simulation and as function of the half-life parameter, with the consideration whether decay of ^{26}O occurs in the reaction target or outside the target. Other values: $\leq 4.0\text{ ns}$, from mean lifetime of $\tau \leq 5.7\text{ ns}$ (2013Ca18) at 95% C.L.; $< 10\text{ fs}$ (2013Th04).</p> <p>Measured cross section=1.8 mb 10 (2012Lu07) for population of the ^{26}O g.s.</p>
1277 96	2+		<p>$J\pi$: 2016Ko11 propose as the first excited state of ^{26}O.</p> <p>E(level): From $E_{\text{res}}=1280\text{ keV} +110-80$ (2016Ko11 list as $1.28\text{ MeV} +11-8$). Compiler used $E_{\text{res}}=1295\text{ keV } 95$, with symmetric uncertainty, to deduce the excited level energy. FWHM 540 keV at 1300 keV. 2016Ko11 note that the systematic uncertainty associated with the excited state decay energy is negligible compared to the statistical uncertainty.</p>
2000?†			<p>E(level): From 2013Ko10, resonance energy at approximately 2 MeV from Figure 1 in 2013Ko10. Note that position of this state in Figure 1 is based on predictions from the continuum shell model calculations. Possible first excited state.</p>
4230† 200			<p>E(level): Deduced by evaluator from measured $E_r=4225\text{ keV} +227-176$ (2013Ca18) and considering $E_{\text{res}}=18\text{ keV } 10$ (stat) 4 (syst) for g.s. Evaluator used $E_{\text{res}}=4250\text{ keV } 200$, with symmetric uncertainty, to deduce the excited level energy.</p>

† 2016Ko11 note that no resonance like structure at higher energies reported by 2013Ca18 was observed.

Adopted Levels, Gammas

$Q(\beta^-)=18190$ 80; $S(n)=770$ 110; $S(p)=15970$ 140; $Q(\alpha)=-15.80\times 10^3$ 21 2012Wa38.

Time-of-Flight spectrometer at the LAMPF accelerator (1995ReZZ).

Particle stability established in beryllium + ^{48}Ca reactions (1979We10) and thorium + p reactions (1988Wo09).

Production cross section ~ 0.05 μb , measured in ^{40}Ar fragmentation reaction of $^9\text{Be}(^{40}\text{Ar}, X)$, $E=90\text{A MeV}$ – 2007No13. In 2006Kh08, cross section= 2221 mb 52 at magnetic rigidity ($B\rho$)= 2.753 Tm, $E=42.03$ MeV/u and cross section= 2424 mb 71 at $B\rho=2.575$ Tm, $E=36.69$ MeV/u for $\text{Si}(^{28}\text{Ne}, X)$ and related reduced strong absorption radius $\langle r_0 \rangle \geq 1.225$ fm² 22 are measured. The later one is used to study the isospin dependence of the reduced strong absorption radius. Measured ^{26}F production cross sections: $\sigma_f=0.048$ μb 15 from ^{40}Ar fragmentation, $E=1.06$ GeV/u, on Be target (2000Oz01); 2003Oz01 reported fragmentation cross section from ^{40}Ar , $E=94$ MeV/u, $\sigma_f=0.001$ μb 4 on Be target and $\sigma_f=0.26$ μb 8 on Ta target.

2001Oz03: Due to poor statistics, unable to determine the halo structure of ^{26}F from the measured interaction cross section of ^{26}F with C target.

2010Ro23: Measured one-neutron-removal cross section $\sigma_{1n}=110$ mb 24.

 ^{26}F Levels**Cross Reference (XREF) Flags**

- A ^{26}F IT Decay (2.2 ms)
- B $^1\text{H}(^{27}\text{F}, ^{26}\text{F}\gamma)$
- C $^9\text{Be}(^{26}\text{Ne}, n^{25}\text{F})$
- D $^{12}\text{C}(^{27}\text{Na}, ^{26}\text{F}\gamma)$

E(level)	$J\pi^\dagger$	XREF	$T_{1/2}$	Comments
0.0	1+	AB D	8.2 ms 9	<p>$\% \beta^- = 100$; $\% \beta^- n = 13.5$ 40.</p> <p>$J\pi$: Log $ft=4.9$ to 0+, Log $ft=4.6$ to 2+. $J\pi=1+$ is consistent with the Gallagher-Moszkowski spin-coupling rule for configuration $\pi d_{5/2} \otimes v d_{3/2}$.</p> <p>$T_{1/2}$: Weighted average of 7.8 ms 6 (2013Le03 – Figure 2), and 10.2 ms 14 (1999Re16). Half-lives were measured from $\gamma(t)$ measurements. Others: 9.6 ms 8 (1999Dl01, 2001Pe14 – value from the same research group of 1999Re16), 7.7 ms 2 – 1672.5 $\gamma(t)$ and 7.8 ms 5 – 1797.1 $\gamma(t)$ growth (due to IT decay) curve fitting (2013Le03).</p> <p>$\% \beta^- n$: Average value of 16 4 (2013Le03) and 11 4 (1999Re16, 2001Pe14). Uncertainty – from input value.</p>
643.4 1	(4+)	A	2.2 ms 1	<p>$\% \text{IT}=82$ 11; $\% \beta^- = 18$ 11; $\% \beta^- n = 12$ 8.</p> <p>E(level): 2013Le03 state that the 643.4-keV, 4+ isomer may correspond to the 657 keV 7, 2+ level. Further, 2013Le03 state that the energy of the isomer is ~ 650 10 keV. See spin-parity comments.</p> <p>$J\pi$: From shell model calculations in 2013Le03, assuming 643.4 γ as a M3 transition to 1+.</p> <p>If this excited level is considered to be the same as 657 keV 7, the hypothesis of isomerism of 4+ state would be due to the emission of a very low energy 4+ to 2+ transition (up to 10 keV (to ensure having a long-lived isomer), then followed by 2+ to 1+ transition – noted in 2013Le03).</p> <p>$T_{1/2}$: From 643.4 $\gamma(t)$ (2013Le03).</p> <p>$\% \text{IT}$: From 2013Le03. May be considered an estimated value, since three decay modes of this isomeric state, i.e. IT, β^-, and $\beta^- n$, coupled with same decay product through $\beta^- n$ decay branch of ^{26}F ground state make the measurements a challenge. Reported isomeric ratio $R=42$ 8% in 2013Le03 may also be considered as an estimated value for aforementioned reasons.</p> <p>$\% \beta^-$: From 100 – $\% \text{IT}$.</p> <p>$\% \beta^- n$: 65 18% of $\% \beta^- = 18$ 11 β^- branch of 4+ isomeric state (e-mail communication with A. Lepailleur ((1st author of 2013Le03): dated Sept 10, 2015). Note that 2013Le03 do not seem to provide explanation or methodology for the extraction of $\% \beta^- n$ decay mode with a relative value of 65% 18.</p>
657 7	(2+)	B D		<p>$J\pi$: Shell model calculations predict 2+ state as the 2nd excited excited state in ^{26}F (2004El10 – $^1\text{H}(^{27}\text{F}, ^{26}\text{F}\gamma)$).</p>
1050 120		C		<p>E(level): Deduced by evaluators from $E(\text{res})=271$ keV 37*($\text{Mass}(^{25}\text{F}) + \text{Mass}(n)/\text{Mass}(^{25}\text{F}) + S_n(^{26}\text{F})=770$ keV 110 (2012Wa38). 2011Fr13 deduced 1072 keV 120, using separation energy obtained from excess mass: 18680 keV 80 (2007Ju03).</p> <p>In the decay spectrum, a broad peak was fitted considering a single resonance. Shell model calculations predict several unbound states.</p>

[†] From shell model calculations, except otherwise noted.

Adopted Levels, Gammas (continued) $\gamma(^{26}\text{F})$

E(level)	E γ	I γ	Mult.	Comments
643.4	643.4 1	100	[M3]	E γ : Delayed transition. Not observed in coincidence with β transitions from ground state.
657	657 7	100		E γ : From 2012St01 (^{27}Na , $^{26}\text{F}\gamma$). Other: 665 12 (2004El10 – (^{27}F , $^{26}\text{F}\gamma$)).

 ^{26}F IT Decay (2.2 ms) 2013Le03

Parent ^{26}F : E=643.4 1; J π =4+; T $_{1/2}$ =2.2 ms 1; %IT decay=82 11.

^{26}F –%IT decay: %IT=82 11 (2013Le03). Note that uncertainty is listed as 14% in the abstract of the paper.

^{26}F was produced from fragmentation of a primary beam of ^{36}S , E=77.6 MeV/nucleon on a Be target (thickness 237 mg/cm²), separated by LISE spectrometer at GANIL, identified from energy loss in a stack of Si detectors and time-of-flight, and implanted in a 1 mm-thick double-sided Si stripped (DSSSD) detector surrounded by four clover HPGe detectors. Measured E γ , I γ , $\beta\gamma$ and $\gamma\gamma$ coincidences, half-life of ^{26}F g.s. and isomer, % β^- n. Deduced levels, J, π . Comparison with Shell model calculations.

 ^{26}F Levels

E(level)	J π	T $_{1/2}$	Comments
0.0	1+		
643.4 1	4+	2.2 ms 1	<p>%IT=82 11; %β^-=18 11; %β^-n=12 8.</p> <p>%IT: from 2013Le03. May be considered an estimated value, since three decay modes of this isomeric state, i.e. IT, β^-, and β^-n, coupled with same decay product through β^-n decay branch of ^{26}F ground state make the measurements a challenge. Reported isomeric ratio R=42 8% in 2013Le03 may also be considered as an estimated value for aforementioned reasons.</p> <p>%β^-: From 100 – %IT.</p> <p>%β^-n: 65 18% of %β^-=18 11 β^- branch of 4+ isomeric state (e-mail communication with A. Lepailleur ((1st author of 2013Le03): dated Sept 10, 2015). Note that 2013Le03 do not seem to provide explanation or methodology for the extraction of %β^-n decay mode with a relative value of 65% 18.</p> <p>E(level): 2013Le03 state that the 643.4-keV, 4+ isomer may correspond to the 657 keV 7, 2+ level reported in 2012St01 (Phys. Rev. C85, 017303), albeit with a weak confidence. In this scenario, the 657-keV, 4+ isomer will decay via a 2+ state of very low energy (up to 10 keV in consistency with Weisskopf lifetime estimates) and then by the 643.4γ to the 1+ ground state. Further, 2013Le03 state that the energy of the isomer is $\approx$650 10 keV.</p> <p>Jπ: From shell model calculations in 2013Le03, assuming 643.4γ as a M3 transition to 1+. If this excited level is considered to be the same as 657 keV 7 reported in 2012St01 (Phys. Rev. C85, 017303), the hypothesis of isomerism of 4+ state would be due to the emission of a very low energy 4+ to 2+ transition (up to 10 keV to ensure having a long-lived isomer), then followed by 2+ to 1+ transition – noted in 2013Le03.</p> <p>T$_{1/2}$: From 643.4γ(t) (2013Le03).</p>

 $\gamma(^{26}\text{F})$

E γ	E(level)	I $\gamma^{\dagger\dagger}$	Mult.
643.4 1	643.4	34 2	[M3]

† Absolute intensity per 100 ^{26}F decay – received from A. Lepailleur (1st author of 2013Le03) through e-mail communications (Sept 17, 2015).

‡ For absolute intensity per 100 decays, multiply by 1.00 14.

^{26}F IT Decay (2.2 ms) 2013Le03 (continued)Decay Scheme

Intensity: I(γ +ce)
per 100 parent decays
%IT=82 11

$^1\text{H}(^{27}\text{F}, ^{26}\text{F}\gamma)$ 2004E110

2004E110: $^1\text{H}(^{27}\text{F}, ^{26}\text{F}\gamma)$; ^{27}F was obtained bombarding a primary beam of ^{40}Ar , $E=94$ MeV/u, on ^{181}Ta target; reaction products were momentum and mass analyzed by RIPS fragment separator at RIKEN and identified by energy loss, time-of-flight and magnetic rigidity; the secondary beam of ^{27}F , $E=40$ MeV/nucleon, directed to a liquid hydrogen target; $E\gamma$ was measured by DALI2 setup of 146 NaI(Tl) scintillator detectors.

 ^{26}F Levels

E(level)	$J\pi^\dagger$	Comments
0.0	1+	
665	(2+)	$J\pi$: 2+ state is predicted to be the 2nd excited state in ^{26}F in shell model calculations (2004E110).

† From Adopted Levels.

 $\gamma(^{26}\text{F})$

$E\gamma$	E(level)	Comments
^x 468 17		$E\gamma$: Peak energy determined at 2.2 σ confidence level. The shell model calculation for the members of $\pi d_{5/2} \otimes \nu d_{3/2}$ multiplets gives the lowest excited state at 353 keV level with $J\pi=4+$. 2004E110 conclude that 468 γ depopulating from this 4+ state to g.s. is unlikely, since it will be a M3 transition having too long lifetime to be observed in their experiment.
665 12	665	$E\gamma$: Peak energy determined at 3.8 σ confidence level. Placement of 665 γ from 2+ state is proposed by 2004E110 from shell model calculations.

^x γ ray not placed in level scheme.

 $^9\text{Be}(^{26}\text{Ne}, n^{25}\text{F})$ 2011Fr13

^{26}Ne secondary beam, $E=80$ MeV/nucleon, produced from a ^{40}Ar primary beam, $E=140$ MeV/nucleon, at the National Superconducting Cyclotron Laboratory of MSU. Target=721 mg/cm² thick beryllium target. ^{25}F fragments detected by charged-particle detectors. Neutrons were detected in coincidence by the Modular Neutron Array (MoNA). Measured decay energy spectra. Deduced resonance level.

 ^{26}F Levels

E(level) †	Comments
1050 120	E(level): Deduced by evaluators from $E(\text{res})=271$ keV $37 \times (M(^{25}\text{F}) + M(n)) / M(^{26}\text{F}) + \text{Sn}(^{26}\text{F})=770$ keV 110 (2012Wa38). 2011Fr13 deduced 1072 keV 120, using separation energy obtained from excess mass: 18680 keV 80 (2007Ju03). A broad peak in the decay spectrum, fitted considering a single resonance and yield 271 keV 37 which was assumed to

Continued on next page (footnotes at end of table)

${}^9\text{Be}({}^{26}\text{Ne}, \text{n} {}^{25}\text{F})$ **2011Fr13 (continued)** **${}^{26}\text{F}$ Levels (continued)**

<u>E(level)[†]</u>	<u>Comments</u>
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decay to ground state of ${}^{25}\text{F}$. Shell model calculations predict several unbound states.

[†] Decay energy spectra calculated from the difference of the invariant mass of ${}^{26}\text{F}$ and the sum masses of the neutron and ${}^{25}\text{F}$. The mass excess values of ${}^{25}\text{F}$ and ${}^{26}\text{F}$ used were 11410 keV 90 and 18680 keV 80, respectively.

 ${}^{12}\text{C}({}^{27}\text{Na}, {}^{26}\text{F}\gamma)$ **2012St01**

Also ${}^{12}\text{C}({}^{28}\text{Na}, 26(\text{fragment})\gamma)$.

E=60 MeV/nucleon secondary ${}^{27,28}\text{Na}$ beam was produced by fragmentation of 77.5 MeV/nucleon ${}^{36}\text{S}$ beam with a 398 mg/cm² C target at GANIL facility. The spectrometer was optimized to 27 , ${}^{28}\text{Na}$ selection. ${}^{26}\text{F}$ nuclei were selected and identified on an event-by-event basis through the SPEG spectrometer using time-of-flight, focal-plane position and energy loss information. The secondary reaction target was 103.5 mg/cm² plastic scintillator sandwiched between two carbon foils of 51 mg/cm². Gamma rays detected by an array of 74 BaF₂ detectors. Deduced level energies. Comparison with shell-model calculations.

 ${}^{26}\text{F}$ Levels

<u>E(level)</u>	<u>$J\pi^{\dagger}$</u>
0.0	1+
657 7	(2+)

[†] From Adopted Levels.

 $\gamma({}^{26}\text{F})$

<u>$E\gamma$</u>	<u>E(level)</u>
657 7	657

Adopted Levels, Gammas

$Q(\beta^-)=7340$ 19; $S(n)=5530$ 50; $S(p)=18170$ 80; $Q(\alpha)=-11230$ 60 2012Wa38.

Measured two-proton removal cross section, $\sigma_{\text{inclusive}}=1.50$ mb 10, from ^{28}Mg (2004Bb03, 2003Ba52 – Same group).

Production cross section ~ 0.01 mb, measured in ^{40}Ar fragmentation reactions of both $^9\text{Be}(^{40}\text{Ar}, X)$, $E=90\text{A MeV}$, and $^{181}\text{Ta}(^{40}\text{Ar}, X)$, $E=94\text{A MeV}$ – 2007No13. In 2006Kh08, cross section= 2221 mb 21 at magnetic rigidity ($B\rho$)= 2.753 Tm, $E=51.75$ MeV/u and cross section= 2229 mb 15 at $B\rho=2.575$ Tm, $E=45.25$ MeV/u for $\text{Si}(^{28}\text{Ne}, X)$ and related reduced strong absorption radius $\langle r_0^2 \rangle \geq 1.203$ fm² 7 are measured. The later one is used to study the isospin dependence of the reduced strong absorption radius. Measured production cross section of ^{26}Ne from ^{36}S fragmentation, $E=75$ MeV/u, on Ta and C targets are ~ 0.1 mb/sr and ~ 0.01 mb/sr, respectively, at $\theta=0$ (1999D101).

 ^{26}Ne Levels**Cross Reference (XREF) Flags**

A ^{26}F β^- Decay (8.2 ms)
 B ^{26}F β^- Decay (2.2 ms)
 C ^{30}Na $\beta^- \alpha$ Decay
 D $^9\text{Be}(^{36}\text{S}, X\gamma)$
 E $^{26}\text{Mg}(\pi^-, \pi^+)$
 F Coulomb Excitation

E(level) [†]	J $\pi^{\ddagger}$	XREF	T _{1/2}	Comments
0.0	0+	AB DEF	197 ms 2	% β^- =100; % β^-n =0.13 3. T _{1/2} : From beta decay activity (1992Te03 – reported uncertainty 1 – probably statistical only – evaluator increased to 2). Others: 192 ms 6 (82.5 γ (t) – 2004We11); 2007Su05 reports 192 ms 4 (153 γ (t)), 193 ms 3 (232 γ (t)) and 190 ms 10 (1212 γ (t)); 230 ms 60 (1987DuZU). % β^-n : from 1992Te03. Other: <0.2% (2004We11). J π : E2 to 0+. T _{1/2} : From B(E2)=0.0141 18 (Coul. Ex. –2007Gi06) and adopted γ -ray properties. J π : log ft =5.1 for b– from (4+) in ^{26}F β^- decay (2.2 ms). γ to 2+. J π : J π =0+ was originally assigned in $^{26}\text{Mg}(\pi^-, \pi^+)$ (1980Na12). 2007Gi06 conclude the measured $\sigma=7$ mb 4 ($^{26}\text{Ne}, ^{26}\text{Ne}'\gamma$) – is not consistent with J π =0+ and comparing with shell model calculation it is assigned as 2+ ₂ . J π : log ft =5.6 for β^- from (1+) in ^{26}F β^- decay (9.7 ms) and shell model calculations. J π : log ft =5.7 for β^- from (4+) in ^{26}F β^- decay (2.2 ms). B(E1) $\uparrow$ =0.0049 16 (2008Gi09); B(E2) $\uparrow$ =0.0049 8 (2008Gi09). E(level): E1 excited pygmy state detected at energies of ≈ 9 MeV (2008Gi09). This state decays by neutron emission to g.s., 1700, 2000, and 3300 levels in ^{25}Ne with branching ratios of 5% 17–5 to g.s.; 66% 15 to 1700+2000; and 35% 9 to 3300 levels, respectively.
2018.0 3	2+	AB D F	0.60 ps 8	
3517.1 5	(3+, 4+)	B D		
3690.8 4	(2+)	AB DeF		
3815.2 5	(0+)	A e		
5360.6 10 ≈ 9000	(3+, 4+)	B F		

[†] From a least-square fit to γ -ray energies.

[‡] From comparison with shell model calculations. Additional arguments, if any, listed in comment section.

 $\gamma(^{26}\text{Ne})$

E(level)	E $\gamma^{\ddagger}$	I γ	Mult.	α	Comments
2018.0	2017.9 3	100	E2	3.25×10^{-4}	Mult.: From Coulomb excitation.
3517.1	1499.1 4	100			E γ : From ^{26}F β^- decay (2.2 ms).
3690.8	1672.75 25	100			
3815.2	1797.1 4	100	[E2]	2.20×10^{-4}	
5360.6	1843.4 8	100			

[†] From ^{26}F β^- decay(9.7 ms), except otherwise noted.

^{26}F β^- Decay (8.2 ms) 2013Le03,1999Re16

Parent ^{26}F : $E=0.0$; $J\pi=(1+)$; $T_{1/2}=8.2$ ms 9; $Q(\text{g.s.})=18190$ 80; $\%\beta^-$ decay=100.

2013Le03: ^{26}F was produced from fragmentation of a primary beam of ^{36}S , $E=77.6$ MeV/nucleon on a Be target (thickness 237 mg/cm²); Separated by LISE spectrometer at GANIL, identified from energy loss in a stack of Si detectors and time-of-flight; Implanted in a 1 mm-thick double-sided Si stripped (DSSSD) detector, surrounded by four clover HPGe detectors; $\beta\gamma$ and $\gamma\gamma$ coincidences, deduce level scheme, half-life. Shell model calculations.

1999Re16: ^{26}F was produced by $\text{Ta}(^{36}\text{S},\text{X})$, $E(^{36}\text{S})=2.8$ GeV; Magnetic Spectrometer (LISE3); nuclides were identified by TOF and energy loss in Si; 6 Si and 4 HPGe and 42 ^3He proportional counters; Measured: $E\gamma$, $I\gamma$, $\beta\gamma$ coin, t , β^-n .

 ^{26}Ne Levels

$E(\text{level})^\dagger$	$J\pi^\ddagger$	$T_{1/2}^\ddagger$	Comments
0.0	0+	197 ms 1	
2018.0 3	2+		
3690.8 4	(2+)		$J\pi$: From Adopted Levels. 1999Re16 tentatively assign $J\pi=0+$, as in 1980Na12 from $^{26}\text{Mg}(\pi^-, \pi^+)$ studies.
3815.2 5	(0+)		$E(\text{level})$: 1999Re16 note a few observed events at about 3750 keV which expected to be the 0+ state. However, without any associated γ transitions, 1999Re16 tentatively assign 0+ state for 3691 keV level. It appears that 3750 could be a doublet of 3691 and 3815 keV levels.
$S(n)+x$			$E(\text{level})$: $\text{Sn}(^{26}\text{Ne})=5530$ 50 (2012Wa38).

† From least-squares fit to γ -ray energies.

‡ From Adopted Levels.

 β^- radiations

$E\beta^-$	$E(\text{level})$	$I\beta^-^\ddagger$	$\text{Log } ft$	Comments
(14370 80)	3815.2	2.3 4	5.6 1	
(14500 80)	3690.8	12.0 11	4.8 1	
(16170 80)	2018.0	36 7	4.5 1	
(18190 80)	0.0	36.5 60	4.8 1	$I\beta^-$: 34 6 in 2013Le03. 36.5 60 by evaluators for $\Sigma I\beta^-=100$.
(18190 80)	$S(n)+x$	13.5 40		$I\beta^-$: From $\%\beta^-n=13.5$ 40 (2013Le03).

† From γ -ray intensity balance by evaluators. $\%\beta^-n=13.5$ 40 (2013Le03).

‡ Absolute intensity per 100 decays.

 $\gamma(^{26}\text{Ne})$

$I\gamma$ normalization: Absolute γ intensities are provided by 2013Le03. See comments for $I\gamma$.

$E\gamma$	$E(\text{level})$	$I\gamma^\ddagger$	Mult.	α	Comments
1672.75 25	3690.8	12.0 11	[M1]	1.21×10^{-4}	$E\gamma$: Unweighted average of 1673.0 3 (1999Re16) and 1672.5 3 (2013Le03).
1797.1 4	3815.2	2.3 4	[E2]	2.20×10^{-4}	$E\gamma$: From 2013Le03.
2017.9 3	2018.0	50 6	E2	3.25×10^{-4}	$E\gamma$: Unweighted average of 2018.2 1 (1999Re16) and 2017.6 3 (2013Le03).

$\times 2901^\dagger$

$\times 4153^\dagger$

† Unplaced in the ^{26}F decay scheme (2013Le03).

‡ Obtained from A. Lepailleur (1st author of 2013Le03) through e-mail communications (Sept 16, 2015) for 100 ^{26}F decay.

Absolute intensity per 100 decays.

$\times$ γ ray not placed in level scheme.

^{26}F β^- Decay (8.2 ms) 2013Le03,1999Re16 (continued) **^{26}F β^- Decay (2.2 ms) 2013Le03**

Parent ^{26}F : $E=643.4$ 1; $J\pi=(4+)$; $T_{1/2}=2.2$ ms 1; $Q(g.s.)=18190$ 80; $\% \beta^-$ decay=18 11.

^{26}F was produced from fragmentation of a primary beam of ^{36}S , $E=77.6$ MeV/nucleon on a Be target (thickness 237 mg/cm²); Separated by LISE spectrometer at GANIL, identified from energy loss in a stack of Si detectors and time-of-flight; Implanted in a 1 mm-thick double-sided Si stripped (DSSSD) detector, surrounded by four clover HPGe detectors; $\beta\gamma$ and $\gamma\gamma$ coincidences, deduce level scheme, half-life. Shell model calculations.

 ^{26}Ne Levels

E(level)	$J\pi^\dagger$	Comments
0.0	$0+$	
2017.83 25	$2+$	
3517.0 5	$(3+, 4+)$	
5360.5 10	$(3+, 4+)$	
S(n)+x		E(level): Sn(^{26}Ne)=5530 50 (2012Wa38).

† From Adopted Levels.

 β^- radiations

$E\beta^-$	E(level)	$I\beta^{-\dagger\ddagger}$	Log ft	Comments
(13470 80)	5360.5	0.3 1	5.7	$I\beta^-$: 4% 2 listed in 2013Le03 is relative to 100% β^- branch, whereas the absolute β^- decay branch is only 18% 11.
(15320 80)	3517.0	2.0 2	5.1	$I\beta^-$: 31% 17 listed in 2013Le03 is relative to 100% β^- branch, whereas the absolute β^- decay branch is 18% 11.
(18830 80)	S(n)+x	12 8		$I\beta^-$: 65% 18 of $\% \beta^-=18\%$ 11.

† From γ -ray intensity balance by evaluators. $\% \beta^-=12$ 8 – which is 65% 18 of $\% \beta^-=18\%$ 11 (2013Le03).

‡ For β^- intensity per 100 decays, multiply by 1.0 7.

 $\gamma(^{26}\text{Ne})$

$I\gamma$ normalization: Absolute γ intensities are provided by 2013Le03. See comments for $I\gamma$.

$E\gamma^\dagger$	E(level)	$I\gamma^{\ddagger\S}$	Comments
1499.1 4	3517.0	2.3 2	
1843.4 8	5360.5	0.3 1	
2017.9 3	2017.83		$E\gamma$: From Adopted Gammas.

Footnotes continued on next page

^{26}F β^- Decay (2.2 ms) 2013Le03 (continued) $\gamma(^{26}\text{Ne})$ (continued)

[†] Assigned to isomeric state decay based on $\gamma(t)$ measurements of 1499 γ and 1843 γ yield half-life values of 2.4 ms 2 and 2 ms 1, respectively.

[‡] Obtained from A. Lepailleur (1st author of 2013Le03) through e-mail communications (Sept 16, 2015) for 100 ^{26}F β^- decay.

[§] Absolute intensity per 100 decays.

^{30}Na $\beta^- \alpha$ Decay 1983De23

Parent ^{30}Na : $E=0$; $J\pi=2+$; $T_{1/2}=48$ ms 2; $Q(g.s.)=5570$ 19; $\% \beta^- \alpha$ decay $=5.5 \times 10^{-5}$ 2.
 $\% \beta^- \alpha = 5.5 \times 10^{-5}$ 2 (1983De23).

 $^9\text{Be}(^{36}\text{S}, X\gamma)$ 2005Be60, 2000Be44, 2002Gu08

Others: 2002Az01, 2000Az03.

2005Be60, 2000Be44, 2002Gu08, 2002Az01 (Same Group): ^{26}Ne beam (54 MeV/u to 65 MeV/u) is obtained from fragmentation of primary ^{36}S beam at 77.5 MeV/nucleon on Be target at GANIL selected through the ALPHA spectrometer and directed on a C target located at the SPEG spectrometer; Detectors: An array of 74 BaF₂ detectors and 4 HPGe detectors; Measured prompt E γ , $\gamma\gamma$ coin, deduced level scheme. A 1800 γ is reported in the ^{26}Ne decay scheme by 2002Gu08 and 2002Az01, however, it is not confirmed by 2005Be60 and 2000Be44.

 ^{26}Ne Levels

E(level) [†]	$J\pi$ [‡]
0.0	0+
2024 10	2+
3523 15	
3695 18	

[†] From γ -ray energies.

[‡] From Adopted Levels.

 $\gamma(^{26}\text{Ne})$

E γ [†]	E(level)	$I\gamma$ [†]
1499 10	3523	50 6
1671 15	3695	25 6
2024 10	2024	100 9

[†] From 2005Be60. γ -ray uncertainties quoted from 2000Be44.

Coulomb Excitation 2007Gi06,1999Pr09,2008Gi09

Other: 2007Gi13.

2007Gi06,2007Gi13: $\text{Pb}(^{26}\text{Ne}, ^{26}\text{Ne}'\gamma)$: ^{26}Ne was produced by fragmentation of primary ^{40}Ar beam, $E=95$ MeV/nucleon, on a ^9Be target; secondary ^{26}Ne beam, $E=54$ MeV/nucleon, bombarded a lead target; Particles were identified through event-by event analysis of magnetic rigidity and time-of-flight method; two layers of silicon strip detectors, a layer of Si(Li) detector, 152 NaI(Tl) detectors; Measured $E\gamma$, $\gamma\gamma$ coin, deduced $B(E2)$.

1999Pr09: $\text{Au}(^{26}\text{Ne}, ^{26}\text{Ne}'\gamma) - ^{26}\text{Ne}$ beam on Au target, $E(^{26}\text{Ne})=41.7$ MeV/u, ^{26}Ne beam was produced from a primary beam of ^{40}Ar , $E(^{40}\text{Ar}^{12+}=90$ MeV/u); after passing Au, ^{26}Ne beam was stopped in a cylindrical fast-slow plastic phoswich detector, NSCL NaI(Tl) array; Measured: $E\gamma$, deduced $B(E2)$; $0^+_{gs} \rightarrow 2^+_1$). The $E(2^+_1)$ level energy for ^{26}Ne was well understood in the context of 0 $\hbar\omega$ configuration as concluded by 1999Pr09.

2008Gi09: $\text{Pb}(^{26}\text{Ne}, ^{26}\text{Ne}'\gamma)$: ^{26}Ne was produced by fragmentation of primary ^{40}Ar beam, $E=95$ MeV/u, on a ^9Be target; secondary ^{26}Ne beam, $E=58$ MeV/nucleon, bombarded a lead target; Charged particles detected with single-sided silicon strip detectors; Measured $E\gamma$ using 4 π DALI2 array of 152 NaI(Tl) detectors; Detected neutrons using hodoscope of 29 sets of plastic rods and scintillators. Deduce $B(E1)$ and $B(E2)$ values and studied decay pattern of ^{26}Ne pygmy states.

 ^{26}Ne Levels

E(level)	$J\pi^\dagger$	$T_{1/2}$	L	Comments
0.0	0+			
2022 62	2+	0.60 ps 8		$B(E2)^\dagger=0.0141$ 18. $B(E2)^\dagger$: From 2007Gi06. Nuclear contribution subtracted. A $B(E2)=0.025$ 3 (that includes contribution from nuclear excitation) deduced from total cross section=68 mb 8 (2007Gi06) is consistent with earlier value of $B(E2)=0.0228$ 41 in 1999Pr09. $T_{1/2}$: deduced from $B(E2)^\dagger$ and adopted 2017.9 γ properties. $\sigma=68$ mb 8 (2007Gi06); 74 mb 13 (1999Pr09). $\sigma=7$ mb 4 (2007Gi06). $J\pi$: measured σ is not consistent with the $J\pi=0+$, that was proposed in earlier studies. $B(E1)^\dagger=0.0049$ 16 (2008Gi09); $B(E2)^\dagger=0.0049$ 8 (2008Gi09). $E(\text{level})$: From 2008Gi09. E1 excited pygmy state detected at energies of ≈ 9 MeV. This state decays by neutron emission to g.s., 1700, 2000 and 3300 levels in ^{25}Ne with branching ratios of 5% 17-5 to g.s.; 66% 15 to 1700+2000; 35% 9 to 3300 levels, respectively. L: From angular distribution measurements.
3691	(2+)			
≈ 9000			1+2	

† From Adopted Levels.

 $\gamma(^{26}\text{Ne})$

$E\gamma^\dagger$	E(level)	Comments
1683 60	3691	
2022 62	2022	$E\gamma$: 1990 keV 12 (1999Pr09).

† From 2007Gi09.

 $^{26}\text{Mg}(\pi^-, \pi^+) \quad 1980\text{Na12}$

Target: Enriched metallic ^{26}Mg ; Projectile: π^- , $E=162.75$ MeV; many 4-hour runs were taken, measured missing mass spectrum at $\theta=5^\circ$ using magnetic mass spectrometer, measured ^{26}Ne mass excess of 0.44 MeV 7.

 ^{26}Ne Levels

E(level)	$J\pi$	Comments
0.0	0+	
3750	(0+)	$E(\text{level})$: Probably a doublet of 3691 and 3815 keV levels. New 0+ state at 3815.2 keV in Adopted Levels established from ^{26}F β^- decay (9.7 ms). $J\pi$: Proposed in 1980Na12 from shell model predictions at 5280 keV. $J\pi=2+$ in Adopted Levels.

Adopted Levels, GammasQ(β^-)=9354 4; S(n)=5574 4; S(p)=12090 50; Q(α)=-12079 13 2012Wa38. ^{26}Na Levels

Cross Reference (XREF) Flags

A ^{26}Ne β^- DecayB $^{14}\text{C}(^{14}\text{C},\text{d}\gamma)$ C $^{25}\text{Na}(\text{d},\text{p}\gamma)$ D $^{26}\text{Ne}(\text{d},2\text{n}\gamma)$

E Coulomb Excitation

F $^{26}\text{Mg}(\text{n},\text{p})$ G $^{26}\text{Mg}(\text{t},^3\text{He})$ H $^{26}\text{Mg}(^7\text{Li},^7\text{Be})$ I $^{26}\text{Mg}(^{11}\text{B},^{11}\text{C})$

E(level) [†]	J π	XREF	T _{1/2}	Comments
0.0	3+	ABCDE GHI	1.07128 s 25	% β^- =100; μ =+2.851 2; Q=-0.0053 2. Matter radius $\langle r^2 \rangle^{1/2}$ =2.92 fm 3 and 2.93 fm 4 (1998Su07). μ : From 2014StZZ, 1978Hu12. Q: From 2014StZZ, 2000Ke09. Earlier value -0.08 b 5 1982To05. J π : J(g.s.)=3 from Laser spectroscopy measurements (1978Hu12,2013Ma15); π =+ from log ft=4.71 to first 2+ in ^{26}Mg from β^- decay of ^{26}Na . T _{1/2} : From high-precision measurement 2005Gr07; a statistical uncertainty of 0.00013 s combined with a systematic uncertainty of 0.00021 s contribute to the overall uncertainty. Other values: 1.04 s 3 (1958Nu41); 1.03 s 6 (1961Ro08); 1.070 s 30 (1972Kl04); 1.087 s 12 (1973Al13); 1.05 s 2 (1973Kl09); 1.074 s 6 (1992Te03).
82.2 6	1+ [‡]	A CDE G	9 μ s 2	%IT=100. J π : 82.5 γ E2 to 3+.
232.7 6	2+	ABCDE GHI	0.9 ns +6-5	T _{1/2} : From 1987DuZU. XREF: H(210). J π : M1+E2 γ to 3+ and 1+.
406.7 5	2+	ABCDE GH	0.18 ns +17-13	T _{1/2} : From Coulomb excitation. J π : M1+E2 γ to 3+ and 1+. XREF: G(420). E(level): From $^{26}\text{Mg}(^7\text{Li},^7\text{Be})$ 1972Ba35.
840 40		H		
1408.0 10		B g		
1509.0 11	(1+) [‡]	ABCD g		XREF: B(1514).
1660.2 12		B		
1808.0 6	(3+) [#]	C G		XREF: G(1860).
1996.5 7	(4+) [#]	BCD G		
2045.2 7		B G i		
2118.2 8	(5+) [#]	C i		
2126.1 10		B		
2182.3 8		B		
2192.9 8	(2+) [#]	C G		
2225.5 9	(4+) [#]	A CD H		J π : 2225 γ to 3+ g.s. rules out earlier (0+,1+) assignment. XREF: D(2230).
2230.4 8		B		
2284.1 10	(5+)	B G		J π : Assignment is compatible with 2284 γ decay to 3+ g.s. from $^{14}\text{C}(^{14}\text{C},\text{d}\gamma)$ 2006Le17. Other assignment (3+,4+); best fit as 4+ in DWBA analysis although the 3+ prediction gives a good account of all data other than the most forward-angle measurement in (t, ^3He) charge-exchange reaction (1987Pe06).
2422.5 8	(2+) [#]	C		
2452.7 8		B G		
2712.3 12		B G		XREF: G(2697).
2720 3	(1+) [‡]	AB		XREF: A(2721).
2803.9 8		B G		XREF: G(2815).
2853.1 7	(2-) [#]	C F		XREF: F(2860).
2937.8 8	(1+, 2+) [§]	B G		XREF: G(2933).
3134.0 8	(3-) [#]	C G		J π : L=1 in $^{25}\text{Na}(\text{d},\text{p}\gamma)$ 2015Ca03. XREF: G(3123).
3222.8 10	(2+)	B G		XREF: G(3232). J π : Based on differential cross section measurements compared to DWBA calculations from charge-exchange (t, ^3He) reaction and shell-model analysis (1987Pe06). Hypothesis supported by angular distributions measured in $^{14}\text{C}(^{14}\text{C},\text{d})$ (2006Le17).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{26}Na Levels (continued)

E(level) [†]	J π	XREF		Comments
3304.6 12		B	G	XREF: G(3310).
3417.4 12		B	G	XREF: G(3400).
3509.3 8	(4)-#	C		J π : L=1 in $^{25}\text{Na}(\text{d},\gamma)$ 2015Ca03.
3603.4 12		B	G	XREF: G(3618).
3814 15			G	E(level): From $^{26}\text{Mg}(\text{t},^3\text{He})$ 1974F101.
3966 15			G	E(level): From $^{26}\text{Mg}(\text{t},^3\text{He})$ 1974F101.
4090.1 12	(2)-	C	G	J π : Based on 2282 γ to 3+ state at 1807.8 keV; assumed E1 transition according to systematics in this mass region (2015Ca03). L=1 in $^{25}\text{Na}(\text{d},\gamma)$ 2015Ca03.
4188.1 15		B	G	XREF: G(4190). E(level): Probable doublet in 1974F101.
4303.4 8	(5-)#	C		
4440 15			G	E(level): From $^{26}\text{Mg}(\text{t},^3\text{He})$ 1974F101.
4702 15			G I	E(level): From $^{26}\text{Mg}(\text{t},^3\text{He})$ 1974F101. E(level): Probable doublet in 1974F101.
4915.4 9	(6-)#	C	H	XREF: H(4910).
4970 40	(4+)§		G	E(level): From $^{26}\text{Mg}(\text{t},^3\text{He})$ 1974F101.
5013.2 12	(3-, 4-)#	C		
5080 60	(2+)		G	
5480	§		F	
7200			G	E(level): From $^{26}\text{Mg}(\text{t},^3\text{He})$ 1974F101.
9000			G	E(level): From $^{26}\text{Mg}(\text{t},^3\text{He})$ 1974F101.

[†] From least-squares fit to E γ data (by evaluators) yielding a reduced $\chi^2=1.8$ assuming $\Delta(\text{E}\gamma)=1$ keV for γ rays without uncertainty, except where noted.

[‡] Based on observation of allowed β^- decay from 0+ g.s. in ^{26}Ne .

§ Based on differential cross section measurements compared to DWBA calculations from charge-exchange ($\text{t},^3\text{He}$) reaction and shell-model analysis (1987Pe06).

Deduced by excitation energy, angular momentum transfer, spectroscopic factor, comparison with shell-model calculations, and measured γ -ray branching ratios from $^{25}\text{Na}(\text{d},\gamma)$ in 2015Ca03 and 2012WiZW.

 $\gamma(^{26}\text{Na})$

E(level)	E γ [†]	I γ [#]	Mult.@	δ @	Comments
82.2	84 $\frac{+}{-}$ 3	100	E2&		B(E2)(W.u.)=3.6 9.
232.7	153 $\frac{+}{-}$ 3	75.1 25	M1+E2	+0.16 7	I γ : Other: 81 3 (Coulomb Excitation). B(M1)(W.u.)=0.0030 +17-20; B(E2)(W.u.)=19 +20-18.
	232 $\frac{+}{-}$ 2	100 4	M1+E2	-0.32 14	Mult.: M1 in $^{25}\text{Na}(\text{d},\gamma)$ 2015Ca03. B(M1)(W.u.)=0.0010 +6-7; B(E2)(W.u.)=11 10.
406.7	174	2.8 4			
	323	14.6 6	M1+E2	+0.14 9	B(M1)(W.u.)=0.0004 +2-3; B(E2)(W.u.)=0.5 +7-4.
	404 $\frac{+}{-}$ 3	100.0 19	M1+E2	-0.25 12	Mult.: M1 in $^{25}\text{Na}(\text{d},\gamma)$ 2015Ca03. B(M1)(W.u.)=0.0015 +11-14; B(E2)(W.u.)=3 +4-2.
1408.0	1408	100.0			
1509.0	1102	<10.00			
	1279 $\frac{+}{-}$ 3	=100.0	D		E γ : Other: 1274 in (d, γ) 2015Ca03.
1660.2	1578§	100.0			
1808.0	1402	8.8 19			
	1577	24 4			
	1806	100 6			
1996.5	1590§	=54.8			
	1764§	=100.0			
	1996§	=100.0			
2045.2	1639§	100.0			
	2044§ ^a	100.0 ^a			
2118.2	2118	100.0			
2126.1	2126§	100.0			
2182.3	1775§	100.0			
	2101§	18.6			
2192.9	1786	<20.00			
	2193	=100.0			
2225.5	418	6.2 6			

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Na})$ (continued)

E(level)	$E\gamma^\dagger$	$I\gamma^\#$	Mult. @	Comments
2225.5	2219 $\frac{7}{2}$ 4	100 5		E γ : Other: 2225 $^{25}\text{Na}(\text{d},\text{p}\gamma)$ 2015Ca03.
2230.4	1996 $\frac{5}{2}$ a	70.5 a		
	2232 $\frac{5}{2}$	100.0		
2284.1	2284	100.0		
2422.5	2015	100 40		
	2423	90 30		
2452.7	2044 $\frac{5}{2}$ a	37.9 a		E γ : 2045 in Figure 4 of 2006Le17.
	2371 $\frac{5}{2}$	100.0		
2712.3	2630 $\frac{5}{2}$	100.0		
2720	1212 $\frac{7}{2}$ 3	100.0		
	2486 $\frac{7}{2}$ 4	92.0		E γ : Other: 2493 ($^{14}\text{C},\text{d}\gamma$).
2803.9	350 $\frac{5}{2}$	24.1		E γ : 351 in Figure 4 of 2006Le17.
	2805 $\frac{5}{2}$	100.0		
2853.1	2620	81 8		
	2771	100 8		
	2853	60 6		
2937.8	2855	76.2		
	2938	100.0		
3134.0	2727	51 6		
	3134	100 7		
3222.8	1041 $\frac{5}{2}$	100.0		
	1177 $\frac{5}{2}$	42.6		
3304.6	1308 $\frac{5}{2}$	100.0		
3417.4	3335 $\frac{5}{2}$	100.0		
3509.3	3509	100.0		
3603.4	3521 $\frac{5}{2}$	100.0		
4090.1	2282	100.0	D&	Mult.: based on systematics in mass region 2015Ca03.
4188.1	2679 $\frac{5}{2}$	100.0		
4303.4	794	100 7		
	2078	70 6		
	2185	43 4		
4915.4	612	100 6	D&	
	1406	39 4		
	2797	63 5		
5013.2	3205	100.0		

$\dagger$ From $^{25}\text{Na}(\text{d},\text{p}\gamma)$, except otherwise noted.

$\ddagger$ From ^{26}Ne β^- decay.

$\S$ From $^{14}\text{C}(^{14}\text{C},\text{d}\gamma)$.

Relative photon branching from each level.

@ Deduced from angular distributions in $^{14}\text{C}(^{14}\text{C},\text{d}\gamma)$ 2006Le17. Measured D+Q assumed as M1+E2.

& Deduced from differential cross sections and angular distributions in $^{25}\text{Na}(\text{d},\text{p}\gamma)$ 2015Ca03.

a Multiply placed; undivided intensity given.

 ^{26}Ne β^- Decay 2007Su05,2004We11,1987DuZU

Parent ^{26}Ne : E=0.0; $J\pi=0^+$; $T_{1/2}=197$ ms 2; $Q(\text{g.s.})=7340$ 19; % β^- decay=100.

2007Su05: ^{26}Ne radioactive beam produced from a primary beam of ^{48}Ca at 140 MeV/nucleon bombarding a ^9Be target at NSCL facility. The fragments were separated by A1900 fragment separator on the basis of magnetic rigidities. The beam of ^{26}Ne was used in a pulsed mode of 300 ns timing. The detection system consisted of implantation detector, an array of 16 neutron time-of-flight detectors and eight γ -ray detectors of SeGA array. Particle (^{26}Na) identification was achieved by time-of-flight and energy loss information in silicon detectors. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$, (particle) γ coin, β , $\gamma\beta$ coin, isotopic half-life by timing of γ rays. Comparisons with shell-model calculations.

2004We11: Mass separated ^{26}Ne beam from the ISOLDE facility obtained from fission of uranium by 1.4 GeV protons. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$, $\beta\gamma$ coin using Ge detector for γ rays and plastic scintillator for β rays.

1987DuZU: Projectile-fragment isotopic separation technique used to produce ^{26}Ne . Partial decay scheme of ^{26}Na deduced from β decay; γ -ray energies, but not intensities, reported. Measured $T_{1/2}$.

^{26}Ne β^- Decay 2007Su05,2004We11,1987DuZU (continued) ^{26}Na Levels

E(level) [†]	J $\pi^{\ddagger}$	T _{1/2}	Comments
0.0	3+		
82.0 23	1+	9 μs 2	T _{1/2} : From 1987DuZu.
232.9 18	2+		
404 3	2+		J π : Reported as (0+,1+,2+) in 2007Su05.
1511 4	(1+)		J π : Reported as (0+,1+) in 2007Su05.
2219 4	(4+)		J π : Reported as (0+,1+) in 2007Su05.
2721 4	(1+)		J π : Reported as (0+,1+) in 2007Su05.

[†] Taken from 2007Su05.[‡] From Adopted Levels. β^- radiations

E β^-	E(level)	I $\beta^-^{\ddagger}$	Log ft [†]	Comments
(4619 20)	2721	1.9 4	4.7 1	
(5121 20)	2219	0.6 2	5.4 2	
(5829 20)	1511	4.2 4	4.8 1	
(6936 20)	404	0.4 1	6.1 1	
(7107 19)	232.9	1.7 4	5.6 1	Log ft: too low for $\Delta J=2$, $\Delta\pi=\text{no transition}$ (evaluator's note).
(7258 20)	82.0	91.6 2	3.87 6	

[†] Deduced by evaluators using log ft code at www.nndc.bnl.gov. These values are nearly the same as in 2007Su05.[‡] Absolute intensity per 100 decays. $\gamma(^{26}\text{Na})$

E $\gamma^{\ddagger}$	E(level)	I $\gamma^{\ddagger\ddagger}$	α	I($\gamma+\text{ce}$) [‡]	Comments
84 3	82.0	84.2 15	0.128 20	95	I γ : deduced by evaluators from I($\gamma+\text{ce}$) and $\alpha=0.128$ 20 (from BrIcc code). I($\gamma+\text{ce}$): 2007Su05 quote intensity from 2004We11. Evaluators note that 2004We11 give I($\gamma+\text{ce}$)(82.5 γ)=100 but β feeding=92 5 for 82.5-keV level. The latter value implies I($\gamma+\text{ce}$)(82.5 γ)=95, which has been used by 2007Su05.
153 3	232.9	3.4 2			
232 2	232.9	4.4 2			
404 3	404	0.4 1			
1212 3	2721	1.2 3			
1279 3	1511	5.4 2			
2219 4	2219	0.6 2			
2486 4	2721	0.7 2			

[†] Taken from 2007Su05.[‡] Absolute intensity per 100 decays.Decay Scheme

$^{14}\text{C}(^{14}\text{C},\text{d}\gamma)$ 2006Le17

2006Le17: E=22 MeV. Measured $E\gamma$, $I\gamma$, $\text{d}\gamma$ coin, $\gamma\gamma\gamma$ coin, $\gamma(\theta)$, using an array of three (four crystal)

Compton-suppressed 'clover' detectors and seven Compton-suppressed single Ge crystals. The three 'clovers' and one single Ge detectors were placed at 90° , two single crystals at 35° and four at 145° relative to the beam direction. Charged particles were detected with Si detector (E- Δ E) telescope at 0° . Comparisons with shell-model calculations. Detailed discussion of a missing $1+$ state below 3 MeV, and possible candidates.

 ^{26}Na Levels

$E(\text{level})^\dagger$	$J\pi$	$E(\text{level})^\dagger$	$J\pi$	$E(\text{level})^\dagger$	$J\pi$
0.0	3+	2045.4	7	2804.0	8
82.3	6	2126.1	10	2937.8	8
233.6	6	2182.5	8	3222.9	10 (2+)
407.0	6	2230.9	8	3305.0	12
1408.0	10	2284.1	10	3417.5	12
1514.0	8	2452.9	8	3603.6	12
1660.4	12	2712.5	12	4193.1	13
1996.9	7	2726.4	10		
			1+		

† From least-squares fit to $E\gamma$ data, assuming $\Delta(E\gamma)=1$ keV for each γ ray.

 $\gamma(^{26}\text{Na})$

$E\gamma$	$E(\text{level})$	$I\gamma$	Mult.	δ	Comments
82.5	82.3				
150.9	233.6	82	M1+E2	+0.16 7	
233.3	233.6	100	M1+E2	-0.32 14	
324.1	407.0	16	M1+E2	+0.14 9	
350	2804.0	13			$E\gamma$: 351 in Figure 4 of 2006Le17.
406.5	407.0	87	M1+E2	-0.25 12	
1041	3222.9	19			
1107	1514.0	6.5			
1177	3222.9	8.1			
1212	2726.4	25			
1280	1514.0	45	M1 (+E2)	+0.07 10	
1308	3305.0	3.2			
1408	1408.0	33			
1578	1660.4	15			
1590	1996.9	17			
1639	2045.4	7.2			
1764	1996.9	31			
1775	2182.5	14			
1996 †	1996.9	31 †			$E\gamma$: 1997 in Figure 4 of 2006Le17.
	2230.9	31 †			
2044 †	2045.4	7.2 †			$E\gamma$: 2045 in Figure 4 of 2006Le17.
	2452.9	7.2 †			
2101	2182.5	2.6			
2126	2126.1	147			
2232	2230.9	44			
2284	2284.1	14			
2371	2452.9	19			
2493	2726.4	23			
2630	2712.5	19			
2679	4193.1	24			
2805	2804.0	54			
2855	2937.8	9.9			
2938	2937.8	13			
3335	3417.5	20			
3521	3603.6	41			

† Multiply placed; undivided intensity given.

$^{25}\text{Na}(\text{d},\text{p}\gamma)$ 2004Sc43,2015Ca03

2004Sc43: Inverse kinematics reaction: A post-accelerated ^{25}Na beam provided by the REX-ISOLDE facility at CERN was delivered to a 10- μm thick deuterated polyethylene target with a beam energy of 2.2 MeV/nucleon and an intensity of about $1 \times 10^6 \text{ s}^{-1}$. Recoiling nuclei were detected in a segmented 24 $\times$ 4 annular and 16 $\times$ 4 radial Cd-type charged-particle detector telescope comprising an $\approx 500\text{-}\mu\text{m}$ thick ΔE followed by an $\approx 500\text{-}\mu\text{m}$ thick E detector and covers a laboratory range from 15 $^\circ$ to 50 $^\circ$. Coincident γ rays were measured using the MINIBALL array of 24 6-fold segmented, individually encapsulated, HPGe detectors arranged in 8 triple-cluster cryostats. Measured E_γ , $\gamma(\text{ions})$ coincidence. Preliminary report as stated in 2004Sc43.

2015Ca03: Inverse kinematics reaction: A 5-MeV/nucleon ^{25}Na beam was provided by ISAC2 at TRIUMF to impinge a 0.5-mg/cm 2 CD $_2$ target with an intensity of 3×10^7 pps. Recoiling nuclei were detected in the silicon array SHARC in coincidence with deexcitation γ rays recorded in the HPGe clover array TIGRESS. Deduced levels, E_γ , $J\pi$, measured angular distributions and extracted differential cross sections. Results compared with shell model calculations and previous work. See also 2012WiZW, 2012Wi13.

 ^{26}Na Levels

E(level) [†]	$J\pi^{\ddagger}$	L [#]	S [§]	Comments
0.0	3+			
81.8 8	1+			
232.1 6	2+	0	0.144	
405.8 5	2+	0	0.337	
1507.0 9	1+			
1807.6 6	3+	2	0.216	
1996.1 8	4+			E(level), $J\pi$: only reported in 2015Ca03.
2118.2 8	5+	2	0.216	$J\pi$: reported as 4+ in 2012WiZW.
2192.5 8	2+			
2225.3 7	4+	2	0.432	
2422.0 8	2+			
2852.8 7	2-			
3133.6 8	3-	1	0.0983	
3509.3 8	4-	1	0.540	
4089.7 12	2-			E(level), $J\pi$: only reported in 2015Ca03.
4303.3 8	(5-)			
4915.3 9	(6-)			
5012.8 12	(3-, 4-)			

[†] From least-squares fit (by evaluators) to E_γ data yielding a reduced χ^2 of ≈ 1 . An uncertainty of 1 keV is assumed for each E_γ .

[‡] Assignments in 2015Ca03 and 2012WiZW, based on excitation energy, angular momentum transfer, spectroscopic factor, comparison with shell-model calculations, and measured γ -ray branching ratios.

[§] Corrected for forward focusing of emitted γ rays. Extracted from measured and calculated differential cross sections in 2012WiZW.

[#] Deduced from measured differential cross sections and theoretical angular distributions in 2012WiZW.

 $\gamma(^{26}\text{Na})$

$E_\gamma^{\dagger}$	E(level)	$I_\gamma^{\dagger}$	Mult. [#]	Comments
151	232.1	42.9 14		
174	405.8	2.4 3		
232 [‡]	232.1	57.1 18	M1	
323	405.8	12.4 5		
405 [‡]	405.8	85.2 16	M1	
418 [‡]	2225.3	5.8 5		
612	4915.3	49.4 28	[M1]	
794	4303.3	46.9 32		
1102	1507.0	<10		
1274	1507.0	≈ 100		
1402 [‡]	1807.6	6.6 14		
1406	4915.3	19.2 16		
1577 [‡]	1807.6	18.3 26		
1764 [‡]	1996.1	≈ 50 [§]		
1786	2192.5	<20		
1806	1807.6	75.1 45		
1996 [‡]	1996.1	≈ 50 [§]		
2015 [‡]	2422.0	52 18		
2078	4303.3	32.7 25		

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$^{25}\text{Na}(\text{d},\text{p}\gamma)$ 2004Sc43,2015Ca03 (continued) **$\gamma(^{26}\text{Na})$ (continued)**

$E\gamma^\dagger$	E(level)	$I\gamma^\dagger$	Mult.#	Comments
2118	2118.2	100		
2185	4303.3	20.4	19	
2193	2192.5	≈ 100		
2225	2225.3	94.2	39	
2282 ‡	4089.7	100 §	[E1]	Mult.: based on systematics in this mass region (2015Ca03).
2423 ‡	2422.0	48	16	
2620	2852.8	33.5	30	
2727	3133.6	33.6	40	
2771	2852.8	41.5	33	
2797	4915.3	31.3	21	
2853	2852.8	25.0	25	
3134	3133.6	66.4	46	
3205	5012.8	100		
3509	3509.3	100		

† Measured in 2012WiZW except where noted.

‡ Taken from 2015Ca03.

§ Taken from 2012WiZW.

Assignment in 2015Ca03, based on measured angular distributions.

 $^{26}\text{Ne}(\text{d},2\text{n}\gamma)$ 2006Ob05

2006Ob05: Inverse kinematic reaction: Beam= ^{26}Ne , target= ^2H .

$E(^{26}\text{Ne})=9.7$ MeV/nucleon secondary beam produced by ISOL method using SPIRAL facility at GANIL. The primary beam of ^{36}S at $E=77.5$ MeV/nucleon was fragmented on a Carbon SPIRAL target.

Measured $E\gamma$, $I\gamma$, $(^{26}\text{Na})\gamma$ coin using 11 'Clovers' (8 EXOGAM and 3 EUROGAM). The ^{26}Na ejectiles were analyzed in the focal plane of the VAMOS magnetic spectrometer using time-of-flight and $E-\Delta E$ method.

Level scheme is taken from 2006Le17 - ($^{14}\text{C},\text{d}\gamma$).

 ^{26}Na Levels

E(level)	$J\pi$
0.0	3+
82	4
232	3
407	2
1516	9
1998	8
2230	9

 $\gamma(^{26}\text{Na})$

$E\gamma$	E(level)
150	2
232	3
$^x 368$	2
407	2
1284	9
1998 †	8
	2230

† Multiply placed.

x γ ray not placed in level scheme.

Coulomb Excitation 2015Si01

2015Si01: Beam=2.82 MeV/nucleon ^{26}Na produced in bombardment of UC_x target by 1.4 GeV protons provided by the CERN PS Booster and ^{26}Na ions separated by ISOLDE General Purpose separator.

Coulomb excitation target=enriched ^{104}Pd .

A radioactive-beam Coulomb-excitation experiment with ^{26}Na ($T_{1/2}=1.07$ s) performed using the REX-ISOLDE facility at CERN. ^{26}Na ions ($q=6^+$) were post accelerated to 2.82 MeV/nucleon and impinged upon a 3.6-mg/cm² thick ^{104}Pd target with an average beam intensity of 6.4×10^4 ions/s for an irradiation period of 73 h. Scattered beam and target nuclei were detected using the 500- μm double-sided silicon strip detector. Deexcitation γ rays following Coulomb excitation of projectile and target nuclei were detected using the MINIBALL γ -ray spectrometer comprising eight triple-cluster detectors, each consisting of three six-fold-segmented HPGe crystals. Measured E_γ , I_γ , (scattered particle) γ -coin. The coupled-channels Coulomb-excitation code GOSIA2 was used to obtain transition matrix elements from observed γ -ray yields and known spectroscopic data (branching ratios, multipole mixing ratios and half lives). Deduced B(E2) and B(M1) values are compared to *sd* shell-model calculations using various interactions: universal *sd* (USD), universal *sd*-A (USDA), and universal *sd*-B (USDB) interaction.

 ^{26}Na Levels

E(level) [†]	$J\pi$	$T_{1/2}$	Comments
0.0	$3+\frac{5}{2}$		
82.4 6	$1+\frac{3}{2}$		
233.2 8	$2+\frac{5}{2}$	0.7 ns +6-5	B(E2) $\uparrow$ =0.00421 +46-41. B(E2) from 3+ g.s. to 233 level deduced by evaluators from experimental B(E2)(W.u.)=12.9 +14-13, branching ratio and mixing ratio for 233 γ . $T_{1/2}$: deduced by evaluators from B(E2)(W.u.) and adopted 233 γ properties.
407.0 20	$2+\frac{5}{2}$	0.18 ns +17-13	B(E2) $\uparrow$ =0.001039 96. B(E2) from 3+ g.s. to 407 level deduced by evaluators from experimental B(E2)(W.u.)=3.18 29, branching ratio and mixing ratio for 407 γ . $T_{1/2}$: deduced by evaluators from B(E2)(W.u.) and adopted 407 γ properties.

[†] From least-squares fit to E_γ data, assuming 0.5 keV uncertainty for 82.5-keV transition.

[‡] From Adopted Levels.

[§] Deduced from best fit to ($t, ^3\text{He}$) angular distributions in 1987Pe06, although these assignments were not adopted in Endt's 1990En08 evaluation. 2006Le17 in their $^{14}\text{C}(^{14}\text{C}, d\gamma)$ claim to confirm 2+ assignment for both the 233- and 407-keV levels.

 $\gamma(^{26}\text{Na})$

E(level)	E_γ	I_γ	Mult. [†]	$\delta^\ddagger$	α	Comments
82.4	84 3		[E2]		0.137 4	B(E2)(W.u.)=3.10. E_γ : From Adopted Gammas. B(E2)(W.u.) deduced by 2015Si01 from known half-life of 82.4 level and theoretical conversion coefficient for 82.5 γ from BrIcc code. Shell-model predictions (2015Si01) for corresponding B(E2)(W.u.) values are 8.66 (USD), 8.39 (USDA) and 6.88 (USDB).
233.2	151 1	81.0 32	M1+E2	+0.16 7		B(M1)(W.u.)=0.44 +73-22; B(E2)(W.u.)=26 +67-19. Shell-model predictions for corresponding B(M1)(W.u.) in 2015Si01: 0.0002 (USD), 0.011 (USDA) and 0.023 (USDB). Shell-model predictions for corresponding B(E2)(W.u.) in 2015Si01: 3.09 (USD); 1.23 (USDA); 1.84 (USDB). I_γ : corrected number of counts reported as 3279 131 in 2015Si01.
	233 1	100 4	M1+E2	-0.32 14		B(M1)(W.u.)=0.13 +28-7; B(E2)(W.u.)=12.9 +14-13. Shell-model predictions for corresponding B(M1)(W.u.) in 2015Si01: 0.14 (USD), 0.04 (USDA) and 0.07 (USDB). Shell-model predictions for corresponding B(E2)(W.u.) in 2015Si01: 6.25 (USD), 10.06 (USDA) and 10.04 (USDB). I_γ : corrected number of counts reported as 4046 162 in 2015Si01.
407.0	(324)	18				E_γ, I_γ : from $^{14}\text{C}(^{14}\text{C}, d\gamma)$ (2006Le17).

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Coulomb Excitation 2015Si01 (continued) $\gamma(^{26}\text{Na})$ (continued)

E(level)	E_γ	I_γ	Mult. [†]	$\delta^\dagger$	Comments
407.0	407.2	100.10	M1+E2	-0.25 12	B(M1)(W.u.)=0.15 +42-8; B(E2)(W.u.)=3.18 29. Shell-model predictions for corresponding B(M1)(W.u.) in 2015Si01: 0.34 (USD), 0.34 (USDA) and 0.32 (USDB). Shell-model predictions for corresponding B(E2)(W.u.) in 2015Si01: 11.27 (USD), 7.91 (USDA) and 7.89 (USDB). I_γ : corrected number of counts reported as 1374 137 in 2015Si01.

[†] From Adopted Gammas. **$^{26}\text{Mg}(\text{n,p})$ 1987Ye03**

1987Ye03: Primary proton beam from TRIUMF cyclotron was delivered to a ^7Li production target at the TRIUMF nucleon charge-exchange facility. Breakup neutrons then impinged a ^{26}Mg target at 198 MeV and recoiling nuclei were measured at 0°, 5°, 10°, and 15°. Excited states in ^{26}Na observed as distinct groups in the particle-energy spectra. Results compared to Gamow-Teller strength predictions. See also 1986AlZJ.

 ^{26}Na Levels

E(level)	Comments
160	E(level): Level is not adopted by evaluators; it is possibly the centroid of a doublet corresponding to the first two excited states at around 82 and 233 keV.
2860	
5480	

 $^{26}\text{Mg}(\text{t},^3\text{He})$ 1974F101,1987Pe06,2006Ze01

1974F101: Triton beam E=23.5 MeV provided by Los Alamos Van de Graff facility impinged upon ^{26}Mg target. Reaction products measured from 15 to 30° at 5° intervals using E- ΔE silicon surface-barrier-detector telescope with a 50 μm ΔE detector. Excited states in ^{26}Na were populated using charge-exchange ($\text{t},^3\text{He}$) reaction and relative $d\sigma/d\Omega$ measured.

1987Pe06: $^3\text{H}^-$ ions accelerated to 36 MeV by tandem Van de Graff accelerator with average beam intensity of 200 nA and incident upon self-supporting foils of ^{26}Mg with thicknesses of 0.20 mg/cm² and 1.50 mg/cm². Recoiling particles measured using Daresbury 1 m scattering chamber in conjunction with five ΔE -E semiconductor telescopes. ΔE detectors were between 118 and 155 μm thick and E detectors 5 mm thick. Particle-energy spectra and differential cross sections obtained over angular range 15 to 50°. Results compared to DWBA calculations.

2006Ze01,2007Ze04: E=115 MeV/nucleon. Triton beam produced from 140 MeV/nucleon α beam impinging on a Be target. Measured ^3He spectrum, $\sigma(\theta)$ using the s800 spectrometer of two two-dimensional cathode-readout drift detectors (CRDCs). FWHM=300 keV, DWBA analysis. Deduced Gamow-Teller transition strengths.

 ^{26}Na Levels

E(level) [†]	$J\pi^\S$	L [#]	B(GT) [#]	Comments
0.0	3+			
88 15	1+	0	0.41 5	
241 15	2+			
420 15	2+			
1.4×10 ^{3#} 2	1+ [#]	0	0.09 2	E(level): A group of unresolved levels between 1450 and 1650 keV is also reported in 1987Pe06.
1860 [‡] 60				
1996 30				
2048 15				
2186 15				
2290 15	(3+, 4+)			$J\pi$: Best fit as 4+ in DWBA analysis although the 3+ prediction gives a good account of all data other than the most forward-angle measurement in 1987Pe06.
2456& 15				

Continued on next page (footnotes at end of table)

$^{26}\text{Mg}(\text{t}, ^3\text{He})$ 1974Fl01, 1987Pe06, 2006Ze01 (continued) **^{26}Na Levels (continued)**

E(level) [†]	J π [§]	L [#]	Comments
2697& 15			
2815 15			
2933 15	(1+, 2+)		
3123 15			
3232 15	(2+)		
3310 15			
3400 15			
3618 15			
3814 15			
3966 15			
4083 15			
4190 15			E(level): Probably doublet (1974Fl01).
4200@	2-	1@	J π : From Figure 4 of 2006Ze01.
4440 15			
4702 ^a 15			E(level): Probably doublet (1974Fl01).
4970 ^a 40	(4+)		
5080 ^a 60	(2+)		
7200@		1@	
9000@		1@	

[†] From measured particle-energy spectra in 1974Fl01 except where noted.

[‡] From measured particle-energy spectra in 1987Pe06.

[§] From DWBA analysis in 1987Pe06 except where noted.

[#] Based on Gamow-Teller strengths in 2006Ze01.

@ From spectrum in Figure 1 of 2006Ze01.

& Level observed as part of multiplet centered on 2600 keV 200 in 2006Ze01 listing J π =1⁺, L=0, and B(GT)=0.13 2.

^a Level observed as part of multiplet centered on 5100 keV 400 in 2006Ze01 listing J π =1⁺, L=0, and B(GT)=0.22 4.

 $^{26}\text{Mg}(^7\text{Li}, ^7\text{Be})$ 1972Ba35, 1985Do14

1972Ba35: E(^7Li)=36 MeV from Chalk River MP tandem accelerator incident upon $\approx 100\text{-}\mu\text{g}/\text{cm}^2$ thick ^{26}Mg target. Reaction products detected in two solid-state ΔE -E detectors positioned at forward ($\theta < 20^\circ$) angles. ΔE counters of thicknesses 11 μm and 33 μm were used together with 100 μm E and a 2000 μm anti-coincidence counter. Measured excited states in ^{26}Na from particle-energy spectra.

1985Do14: E(^7Li)=88 MeV measured at the Harwell Variable Energy Cyclotron using silicon ΔE -E telescopes. Measured differential cross sections compared to one-step DWBA angular distribution predictions using microscopic form factors.

 ^{26}Na Levels

E(level) [†]	J π [§]	Comments
0.0	3+	
210 40		
430 [‡] 70	3+	ΔE : An energy resolution of about 70 keV is quoted in 1985Do14.
840 40		
2210 40		
4910 40		

[†] From particle-energy spectra measured in 1972Ba35.

[‡] From particle-energy spectra measured in 1985Do14.

[§] From angular distributions and DWBA analysis in 1985Do14.

²⁶Mg(¹¹B, ¹¹C) 1974Sc26

1974Sc26: a 750 μg/cm² ²⁶Mg target bombarded by an 86-MeV ¹¹B beam at the 88-Inch Cyclotron of the Lawrence Berkeley National Laboratory. Reaction products identified from their time-of-flight (tof) and energy loss using QSD spectrometer. Magnetic rigidity and energy loss measured with position sensitive Borkowski-Kopp proportional counters, TOF measured using a 250-μg/cm² thick NE 111 scintillator foil. Energy levels deduced in ²⁶Na from measured particle spectra.

²⁶Na Levels

E(level)	Comments
0 . 0	
230 150	
2100? 150	E(level): Ambiguous assignment due to close proximity of excited state in ¹¹ C at 1995 keV.
4790? 150	E(level): Ambiguous assignment due to close proximity of excited state in ¹¹ C at 4794 keV.

Adopted Levels, Gammas

$Q(\beta^-) = -4004.43$ 6; $S(n) = 11093.09$ 4; $S(p) = 14145.7$ 12; $Q(\alpha) = -10614.8$ 1 2012Wa38.

Other reactions:

$^{14}\text{C}(^{14}\text{C}, 2n\gamma)$: 2002Ta10.

$^{24}\text{Mg}(^{18}\text{O}, ^{16}\text{O})$: 1980Be43.

$^{26}\text{Mg}(\pi^+, \pi^+), (\pi^+, \pi^-)$: 1993Cl07.

$^{26}\text{Mg}(n, n), (n, n')$: 1983Ta09.

$^{26}\text{Mg}(d, d)$: 1987Nu01, 1983Vo08, 1979To20.

$^{26}\text{Mg}(t, t)$: 1987Pe09, 1986Pe13, 1983Ko18, 1982Sc21.

$^{26}\text{Mg}(^3\text{He}, ^3\text{He})$: 1989Va09, 1982Ve13, 1980Tr02.

$^{26}\text{Mg}(\text{HI}, \text{HI})$: 1989Ru05, 1988Ot08, 1987Wi09, 1986Ci06, 1982Fu09, 1982Sp05, 1981Fu04, 1980St06.

$^{27}\text{Al}(^{13}\text{C}, ^{14}\text{N})$: 1988Va08, 1987Ad07.

$^{28}\text{Si}(^{18}\text{O}, ^{20}\text{Ne})$: 1979Me12.

$^{29}\text{Si}(n, \alpha)$: 2011Zh22, 2010Zh44.

$^{208}\text{Pb}(^{26}\text{Mg}, ^{26}\text{Mg})$, $E = 200$ MeV: 1991He09.

Production cross section 0.394 mb 44, from ^{136}Xe spallation by proton – 2007Na31.

^{26}Mg from bombarding ^{28}Si with protons, $E = 1$ GeV, and 2p emission – 2004Va22.

^{26}Mg from fragmentation reactions at relativistic energies – 2001Ge05.

 ^{26}Mg Levels**Cross Reference (XREF) Flags**

A ^{26}Na β^- Decay

B ^{26}Al ϵ Decay (7.17×10^5 y)

C ^{26}Al ϵ Decay (6.3460 s)

D ^{27}Na $\beta^- n$ Decay

E $^{18}\text{O}(^{13}\text{C}, \alpha n\gamma)$

F $^{22}\text{Ne}(^6\text{Li}, d)$

G $^{23}\text{Na}(\alpha, p\gamma)$

H $^{24}\text{Mg}(t, p)$

I $^{25}\text{Mg}(n, \gamma)$ $E = \text{thermal}$

J $^{25}\text{Mg}(n, \gamma), (n, n)$: Res

K $^{25}\text{Mg}(d, p)$

L $^{25}\text{Mg}(\alpha, ^3\text{He})$

M $^{26}\text{Mg}(\text{pol } \gamma, \gamma'), (\gamma, \gamma')$

N $^{26}\text{Mg}(\gamma, n)$: Res

O Others:

$^{26}\text{Mg}(e, e')$

$^{26}\text{Mg}(p, p'), (p, p'\gamma)$

$^{26}\text{Mg}(\alpha, \alpha'\gamma), ^{22}\text{Ne}(\alpha, n)$

$^{27}\text{Al}(\mu^-, \nu n\gamma)$

$^{27}\text{Al}(d, ^3\text{He})$

$^{27}\text{Al}(t, \alpha)$

$^{28}\text{Si}(\mu^-, \nu p n\gamma)$

$E(\text{level})^\dagger$	$J\pi$	XREF	$T_{1/2}^c$	Comments
0.0	0+	ABCDEFGHI KLM O	stable	$J\pi$: L=0 in (t,p). Optical spectroscopy (1931Mu02, 2013Ma15). Charge radius=2.99 fm 4 (2014Wa14). Matter radius=3.0340 fm 26 quoted in 2012Yo01 from literature.
1808.74 4	2+	AB DE GHI KLM O	476 fs 21	$\mu = +1.0$ 3; $Q = -0.14$ 3. μ : From 1981Sp04, 2014StZZ. Q : Also -0.10 3, both from 1982Sp05, 2014StZZ. $J\pi$: L=2 in (t,p) and (p,p'). $T_{1/2}$: From mean lifetime of 687 fs 30: Weighted average of 653 fs 39 (1981Dy01 – ($^{23}\text{Na}, p$)), 700 fs 50 and 730 fs 30 (1977Sc36), 654 fs 34 (1982Sp05), and 683 fs 75 (1983Ko18 – (t,t')). Uncertainty – lowest input value.
2938.33 4	2+	AB E GHI KLM O	141 fs 8	$J\pi$: L=2 in (t,p) and (p,p'). $T_{1/2}$: From mean lifetime 204 fs 12 (1981Dy01 – ($^{23}\text{Na}, p$)).
3082.9 20		E		
3420.2 17		E		
3564.9 19		E		
3588.56 9	0+	E GHI KLM O	6.45 ps 48	$J\pi$: L=0 in (t,p). $T_{1/2}$: From mean lifetime of 9.3 ps 7: Weighted average of 9.6 ps 12 (1974Be08), 9.5 ps 7 (1974Be43), and 9.29 ps 23 (1984Bh03) – all from (α, p). Uncertainty – lowest input value.
3941.57 4	3+	A E GHI KL O	0.83 ps 12	$J\pi$: 3 in (p,p') and 1003.25 γ M1+E2 to 2+. $T_{1/2}$: From unweighted mean lifetime values of 1.38 ps 11 (1974Be08 – (α, p)) and 1.02 fs 13 (1981Dy01 – ($^{23}\text{Na}, p$)).
4318.89 5	4+	A E GHI L o	272 fs 16	$J\pi$: 4 in (p,p'), (p,p' γ). Natural parity in (α, α'). $T_{1/2}$: From mean lifetime of 392 fs 23 (1981Dy01 – ($^{23}\text{Na}, p$)).
4332.52 5	2+	A E GHI LM O	20 fs 3	$J\pi$: (2) in (p,p'), (p,p' γ), β^- from 3+ in ^{26}Na β^- Decay, natural parity in (α, α'). $T_{1/2}$: From mean lifetime of 29 fs 4 (1981Dy01 – ($^{23}\text{Na}, p$)).

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Adopted Levels, Gammas (continued) **^{26}Mg Levels (continued)**

E(level) [†]	J π	XREF	T _{1/2} ^c	Comments
4350.09 4	3+	A E G I L O	105 fs 28	J π : 3 in (p,p'),(p,p' γ), M1+E2 γ to 2+. T _{1/2} : From mean lifetime of 150 fs 40: Weighted average of 180 fs 55 (1972Du05 – (α ,p)), 90 fs 40 (1968Ha18 – (p,p')), 160 fs 55 (1975Wa10 – (α , α')). Uncertainty – lowest input value.
4644.9 13 4835.13 5	2+	A E GHI KL O	28 fs 6	J π : L=2 in (t,p). T _{1/2} : From mean lifetime 41 fs 8 (1981Dy01 – (^{23}Na ,p)). Other value: 37 fs 8 (1986G106 – (α ,p)).
4901.44 7	4+	A E GHI KL O	29 fs 6	J π : From 1969Ca18 (α , α' γ) – α - γ angular correlation. L=4 in (p,p'),(p,p' γ). T _{1/2} : From mean lifetime 42 fs 8 (1981Dy01 – (^{23}Na ,p)). Other value: 34 fs 8 (1986G106 – (α ,p)).
4972.30 13	0+	GHI KLM O	446 fs 70	J π : L=0 in (t,p). T _{1/2} : From mean lifetime of 644 fs 100: Weighted average of 760 fs 240 (1972Du05 – (α ,p)), 540 fs 250 (1968Ha18 – (p,p')), 640 fs 100 (1975Wa10 – (α , α')). Uncertainty – lowest input value.
5180.5 7 5291.74 6	2+	A E GHI KLM O	<10 fs	J π : L=2 in (e,e') and (p,p'),(p,p' γ), L=(2) in (t,p), natural parity in (α , α'). T _{1/2} : From 1981Dy01 – (^{23}Na ,p). Other values: 15.9 fs 76 (1986G106 – (α ,p)), <35 fs (1968Ha18 – (p,p')), 100 fs 60 (1975Wa10 – (α , α')).
5476.05 7	4+	A E GHI KL O	21 fs 6	J π : L=4 in (t,p). T _{1/2} : From mean lifetime of 30 fs 8: Weighted average of 35 fs 15 (1974Be08 – (α ,p)) and 28 fs 9 (1986G106 – (α ,p)). Other values: <70 fs (1972Du05 – (α ,p)), <50 fs (1975Wa10 – (α , α')).
5691.08 19	(1+)	E G I L O	<8 fs	J π : From 1990Ya07 – (α , ^3He), based on cross section measurement and DWBA calculations. Possible unnatural parity in (α , α'). J π : From (1986G106 – (α ,p)). Other values: <35 fs (1972Du05), 70 fs 50 (1986G106) – both from (α ,p)).
5711.2 8 5715.91 8	(1+, 2+) 4+	A E H K O E G I L O	53 fs 16	J π : L=2 in (d,p), γ to 0+. J π : β^- from 3+ in ^{26}Na β^- Decay, natural parity in (α , α'), γ transitions to 3+, 2+; L=4 in (e,e'). T _{1/2} : From mean lifetime of 77 fs 23: weighted average of 125 fs 35 (1974Be08 – (α ,p)), 48 fs 23 (1986G106 – (α ,p)), and 220 fs 100 (1975Wa10 – (α , α')). Other mean lifetime: <50 fs (1972Du05 – (α ,p)).
6125.47 5	3+	A E GHI KL O	14 fs 6	J π : From angular distribution measurements and analysis in 1990Ya07 – (α , ^3He) and from (e,e'). Unnatural parity in (α , α').
6256.2 14	0+	E GH KL O	53 fs 31	E(level): From ((α , $\alpha\gamma$) – 1975Na06), also in ((α ,p γ) – 1986G106). J π : L=0 in (t,p). T _{1/2} : From mean lifetime of 77 fs 45: Weighted average of 60 fs 50 (1968Ha18 – (p,p')), 90 fs 45 (1975Wa10 – (α , α')). Uncertainty – lowest input value.
6483.2 15 6622.94 14	(4+)	A E G L O	19 fs 5	E(level): Weighted average of 6621 3 (1976Mo27 – (p,p')), 6623 1 (1986G106 – (α , $\pi\gamma$)), and 6621 2 (1975Na06 – (α , $\alpha\gamma$)). J π : From (α , $\pi\gamma$), based on particle- γ -ray angular correlation. T _{1/2} : Other: <70 fs (1975Wa10 – (α , α')).
6634.2 3 6745.13 15	2+	A E G I GHI KL O	≤ 7 fs 16 fs 8	J π : L=2 in (p,p'),(p,p' γ). T _{1/2} : From mean lifetime of 23 fs 11 (1986G106 – (α ,p)). Other mean lifetime values: 80 fs 40 (1968Ha18 – (p,p')), <50 fs (1975Wa10 – (α , α')).

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Adopted Levels, Gammas (continued) **^{26}Mg Levels (continued)**

E(level) [†]	J π	XREF	T _{1/2} ^c	Comments
6876.42 5	3-	GHI KL O	83 fs 35	J π : L=3 in (t,p). T _{1/2} : From mean lifetime of 120 fs 50: Weighted average of 100 fs 60 (1968Ha18 - (p,p')) and 150 fs 75 (1975Wa10 - (α,α')).
6951.7 16		E		
6971.8 20	(4+)	E		J π : 3030 γ D+Q to 3+; Parity from shell model calculations.
6978.3 $\frac{1}{2}$ 8	(5+)	E G	14 fs 5	J π : From γ -decay and γ -feeding (Table 26.12a in 1990En08).
7061.90 20	1-	HI L o	≤ 7 fs	J π : L=1 in (t,p).
7099.68 13	2+	A E HI LM o	≤ 14 fs	J π : L=2 in (t,p).
7200 20	(0,1)+	O		J π : From 1989Cr02 (p,p'), based on measured cross section and calculation.
7246.49 $\frac{1}{2}$ 17	3+a	A	≤ 7 fs	
7261.40 4		E HI K O	≤ 7 fs	XREF: O(7252).
7282.82 6	(4-)	E HI KL O	24 fs 8	J π : From (α,γ) and γ -feeding.
7348.86 6	3-	GHI KL O		J π : L=3 in (t,p). Natural parity ($\alpha,^3\text{He}$).
7371.36 17	2+a	A G I O		
7396.0 $\frac{1}{2}$ 10	(5+)	E GH O	≤ 14 fs	J π : 1680 γ (M1+E2) to 4+. D+Q γ from 5 at 9064.
7428 $\frac{1}{2}$ 3	(0,1)+	H O		J π : From 1989Cr02 (p,p'), based on measured cross section and calculation.
7541.71 6	(2-)	E HI K O	≤ 7 fs	J π : From R(0) with gate on $\Delta J=2$ transition and pol values (2014Bh03 - ($^{13}\text{C},\alpha\gamma$)).
7677 $\frac{1}{2}$ 1	(4+)	GH L O	≤ 11 fs	J π : γ -transition to 4+,3+; Natural parity ($\alpha,^3\text{He}$).
7696.8 8	1(-)	HI LM O		J π : From 1993Ve03 (d, ^3He); 1+ in 1990Ya07 - ($\alpha,^3\text{He}$).
7725.8 4	3+a	A G I K O		XREF: O(7716).
7773.7 $\frac{1}{2}$ 6	(4+)	A E KL O	≤ 7 fs	XREF: O(7762).
				J π : From R(0) with gate on $\Delta J=2$ transition and pol values (2014Bh03 - ($^{13}\text{C},\alpha\gamma$)).
7817.8 $\frac{1}{2}$ 7	(2,3)+	A H K o		J π : L=0+2 in (d,p).
7824 $\frac{1}{2}$ 3	3-a	G L o		J π : Natural parity ($\alpha,^3\text{He}$).
7840 $\frac{1}{2}$ 2	2+	G o		J π : γ transitions to 0+, 2+, and 4+.
7851 3		O		
7950.0 $\frac{1}{2}$ 20	5-	E H KL O	14 fs 6	J π : From 1989Se01 (pol p,p'), based on angular distributions and analyzing power.
8034 $\frac{1}{2}$ 2		G O		L=6 in (p,p'),(p,p' γ) probably erroneous.
8052.4 7	2(+)	GHI O		J π : L=2 in (t,p). L=1 in (d, ^3He).
8184.93 15	3-a	G I L O		
8201.1 7	(6+)	E G O	≤ 14 fs	E(level): Weighted average of 8201 2 (1975Na06 - ($\alpha,\alpha'\gamma$) and 8202 1 (1986G10 - (α,γ)).
8227.31 24	1-a	GHI M O	1.0 fs ^d 2	J π : 1223 γ d to (5+), γ to 4+.
8250.58 16	(3+) ^a	G I L O		XREF: H(8240).
8399 3		O		J π : L=1 in (t,p).
8458.9 4	3+a	G I O		J π : Natural parity in ($\alpha,^3\text{He}$) does not agree.
8464 2		G		XREF: O(8384).
8472.3 $\frac{1}{2}$ 16	(6+)	E G O	≤ 14 fs	J π : L=2 in (d, ^3He).
8503.7 3	1-	G I M O		J π : 1494 γ D+Q to (5+), γ transitions to 4+.
				XREF: O(8488).
8532.1 4	(2+) ^a	G I O		J π : In (pol γ,γ), based on angular correlation and polarization measurements (2009Lo06).
8576 $\frac{1}{2}$ 3		O		XREF: O(8518).
8625 $\frac{1}{2}$ 1	5-	GH L O	29 fs 6	XREF: O(8566).
				XREF: O(8611).
				J π : From 1989Se01 (pol p,p'), based on angular distributions and analyzing power. Also in (α,γ).
8670 $\frac{1}{2}$ 1	(3,5)	G O	≤ 7 fs	Natural parity ($\alpha,^3\text{He}$).
				XREF: O(8660).
8705.6 3	(2 to 4)+	G I L O		J π : 3193 γ and 4350.7 γ D+Q to 4+.
8863.8 4	2+	GHI O		J π : L=2 in (d, ^3He) and from γ decay.
8903.52 9	(2+) ^a	E G I L O		J π : L=2 in (t,p).
8930 $\frac{1}{2}$ 2		GH O		XREF: L(8914)O(8889).
8959.4 5	1-	I M O		XREF: O(8917).
				J π : In (pol γ,γ), based on angular correlation and polarization measurements (2009Lo06).

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Adopted Levels, Gammas (continued) ^{26}Mg Levels (continued)

E(level) [†]	J π	XREF	T _{1/2} ^c	Comments
9020 $\frac{1}{2}^-$ 2		G	O	
9043.4 9	3(+) ^a	G I L	O	J π : Natural parity ($\alpha, ^3\text{He}$) does not agree. Also L=1 in ($d, ^3\text{He}$).
9064 [#] 2	5+	G	O	J π : From 1986G106 – ($\alpha, p\gamma$), 1668 γ D+Q to (5+), γ transition to 4+.
9111.2 $\frac{1}{2}^+$ 5	6+	G	O	J π : From 1986G106 – ($\alpha, p\gamma$), γ transitions to 4+, (5+).
9139.5 13	1		M	J π : From (γ, γ').
9169 $\frac{1}{2}^+$ 3	(6-) [@]	E G	L O	
9206 $\frac{1}{2}^+$ 2		G	O	
9238.9 8	1(+)	I LM	O	XREF: L(9256). J π : From (γ, γ') based on angular correlation and polarization measurements. Also in 1989Cr02 – (p, p'). Uncertain parity by evaluators for L=1 in ($d, ^3\text{He}$). J π : L=4 in (t, p); γ to 3+.
9261 $\frac{1}{2}^+$ 2	(4+)	GH	O	
9281 $\frac{1}{2}^+$ 3	(2+) ^a		o	
9291 $\frac{1}{2}^+$ 2		G	o	
9304 2		G	o	
9316 [#] 2		G	O	
9325.57 20	(2+ to 4+)	G I L	O	J π : γ to 2+, 3+, and 4+.
9371 $\frac{1}{2}^+$ 2	4+	GH	o	J π : L=4 in (t, p).
9383 $\frac{1}{2}^+$ 1	6+	fG	o	J π : (4+, 6+) in 1986G106 ($\alpha, p\gamma$); 2404.6 γ d to (5+) and 2759.9 γ and 3666.8 γ Q to 4+.
9427.8 4	3+ ^a	fG I	O	
9471 $\frac{1}{2}^+$ 2	(1 to 5)+	G	O	J π : L=2 in ($d, ^3\text{He}$), γ to 3+.
9540.3 [#] 15	5+	E G	O	J π : From 1986G106 ($\alpha, p\gamma$). 2562 γ d to (5+), 5221 γ D+Q to 4+.
9563.5 8	1+		LM O	E(level), J π : From 2009Lo06 – (γ, γ'). Spin and parity based on angular correlation and polarization measurements.
9574.06 11	(2- to 4)	G I	O	J π : From γ decay.
9579 $\frac{1}{2}^+$ 3	4+	H	O	J π : L=4 in (t, p).
9590 2		G		
9617.0 9	(1 to 3)-	I	O	J π : L=1 in ($d, ^3\text{He}$); γ to 2+.
9681 $\frac{1}{2}^+$ 2	(0 to 5)+	G	O	J π : L=2 in ($d, ^3\text{He}$).
9714 $\frac{1}{2}^+$ 3			L O	
9770.8 9	1(-)		M	J π : From (γ, γ').
9771 $\frac{1}{2}^+$ 2		G	O	
9779 $\frac{1}{2}^+$ 3	1+		L O	J π : From 1989Cr02 – (p, p') – angular distribution measurements.
9814 $\frac{1}{2}^+$ 2		G	o	
9829.5 $\frac{1}{2}^+$ 14	(5, 7)+	E G	o	J π : From 1986G106 – ($\alpha, p\gamma$) – angular distribution measurements.
9856.8 $\frac{1}{2}^+$ 4	2+	HI	O	J π : L=2 in (t, p).
9883 $\frac{1}{2}^+$ 3			O	
9900.3 [#] 10	3+ ^a	G	O	
9927 $\frac{1}{2}^+$ 2		G	O	
9939 $\frac{1}{2}^+$ 2		G	O	
9967 [#] 2	2+	GH	O	J π : L=2 in (t, p).
9982 $\frac{1}{2}^+$ 2		fG	o	
9989 $\frac{1}{2}^+$ 1	(6+)	fG	o	J π : (M1+E2) γ to (5+) and (6+).
10040 [#] 2	5-	GH	O	J π : L=5 in (t, p).
10069 $\frac{1}{2}^+$ 2		G	O	
10102.5 4	1-	I	M O	J π : From (γ, γ').
10126.7 6	4+	GHI	O	XREF: G(10122)H(10108). J π : L=4 in (t, p).
10136 3			O	
10147.1 1	1+		LM O	E(level), J π : From (γ, γ').
10159 $\frac{1}{2}^+$ 3	0+	H	O	J π : L=0 in (t, p).
10184 $\frac{1}{2}^+$ 2		G	o	
10219.9 9		I	o	
10234 2		G		
10271 $\frac{1}{2}^+$ 3	2+	H	O	J π : L=2 in (t, p).
10319.5 7	1+		M O	E(level), J π : From (γ, γ').
10328 3			O	
10341 $\frac{1}{2}^+$ 3		L	O	J π : 1+ in ($\alpha, ^3\text{He}$).

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Adopted Levels, Gammas (continued) ^{26}Mg Levels (continued)

E(level) [†]	J π	XREF		T _{1/2} ^c	Comments
10349.4 9	(0+ to 4+)	G	I O		J π : γ to 2+.
10362.26 21	(2+ to 4+)	G	I O		J π : γ to 2+, 3+, 4+.
10377 2		G			
10400 15			O		
10414 $\S$ 3	4+	H	O		J π : L=4 in (t,p).
10487 $\S$ 3			o		
10493 $\S$ 3	2+		o		J π : From (e,e'). Note for doublet.
10516 $\S$ 3	(2+)	H	o		J π : L=(2) in (t,p).
10529# 2		G	O		
10567 3		f	O		
10573.3 8	1-		M	0.20 eV 5	J π : From (γ,γ').
10576 2		fG			
10600.1 4	(1+ to 4+)	G	I O		XREF: G(10590).
10647.3 8	1+		LM O	97 as ^d 5	J π : From γ decay.
10650 1	(4- to 7-)	G		21 fs 6	E(level),J π : From (γ,γ').
10681.9 3			O		J π : From γ decay.
10693 3		G	L O		
10707# 3		G	O		
10718.75 9			O		
10726 3			O		
10745.98 12			O		
10767# 2		G	O		
10805.9 4	(0+ to 4+)	f	I M O		J π : γ to 2+.
10824 $\S$ 3	(2+)	f	O		J π : From (e,e').
10881 3			O		
10893 3			O		
10915 3			O		
10927 $\S$ 3	+		L O		J π : Natural parity from ($\alpha,^3\text{He}$).
10945# 3		G	J O		
10949.1 8	1-		M	1.87 eV 30	E(level),J π : From (γ,γ').
10978 $\S$ 3			o		
10998 $\S$ 3			o		
11012# 3		G	o		
11048 3			O		
11084 3			O		
11114 3	(2+)	J	O		J π : Assignment in 2012Ma14 ((n, γ),(n,n):res, based on R-matrix analysis.
11142 6			O		
11153.5 10	1+&	J	MNO		E(level),J π : From (γ,γ').
11162.93 7	2+ ^b	J		5.08 keV 8	
11169.30 7	(3+) ^b	J		1.56 keV 8	
11171 $\S$ 3		J	L O		
11183.06 6	(1-) ^b	J		0.6 eV 2	
11189.24 6	3+ ^b	J		5.24 keV 4	
11191 2		G	J		
11196.51 6		J		2 eV 1	
11243.36 6	(2-) ^b	J		5.520 keV 20	
11274.13 5	(2+) ^b	J		0.590 keV 20	
11280.03 5	4(-) ^b	J		1.730 keV 20	
11285.52 7	1- ^b	J		1.41 keV 6	
11286.24 5	(2+) ^b	J		0.7 eV 7	
11289.06 4	(2-) ^b	J		2 eV 1	
11293.28 5		J		0.230 eV 20	
11296.04 9	(2-)	J		12.40 keV 10	J π : Spin assignment based on χ^2 in 2012Ma14 ((n, γ),(n,n):res).
11310.57 4	(1-) ^b	J		0.4 eV 2	
11326.15 6	(1-)	J		0.3 eV 2	
11328.20 7	(1-) ^b	J		50 eV 20	
11329.11 4		FG	J		E(level): From (n, γ),(n,n):res.
11336.88 5	(1-) ^b	J		0.1 eV 1	
11344.77 7	4(-) ^b	J		3.49 keV 6	
11361.84 23	(2+) ^b	J		3.29 keV 5	

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Adopted Levels, Gammas (continued) ^{26}Mg Levels (continued)

E(level) [†]	J π	XREF	T _{1/2} ^c	Comments
11392.57 5	(5+) ^b	J	240 eV 10	
11441.08 6	4+ ^b	J	2.020 keV 40	
11457 2		FG		
11465.62 8	(5-) ^b	J	8.91 keV 8	
11500.09 5	(1-) ^b	J	25 eV 10	
11526.82 10	(3-) ^b	J	3.00 keV 10	
11570 2		G		
11587.99 7	(2-) ^b	J	1.80 keV 10	
11608.29 6	(4-) ^b	J	0.84 keV 4	
11611 5		f	O	
11646 5		f	O	<3 keV
11795 10			O	<3 keV
11827 2		F	O	<3 keV
11890 2			O	<3 keV
11909 2			O	6 keV 1
11945 10	(6-) [@]	L	O	E(level): From (α , ^3He).
12049 2			O	6 keV 2
12088 2		G		
12110 2			O	25 keV 2
12141 2			O	15 keV 2
12196 2		G		
12345 2	0		O	40 keV 5
12479 [‡] 2	(6-) [@]	G	L O	XREF: L(12512).
12865 10	(6-) [@]		L O	E(level): From (α , ^3He).
12958 10			L	
13958 10			L	
14542 10	(6-) [@]		L O	E(level): From (α , ^3He).
16580 10	(6-) [@]		L O	E(level): From (α , ^3He).
18050 50	(6-) [@]		O	T=2.

[†] From a least-squares fit to γ -ray energies, except otherwise noted. γ rays without uncertainty were calculated after the fit. Source of excited level energies for particle data sets are noted. During least-squares fit, the uncertainty for 1384.70 γ from 5716 keV level 958.81 γ from 4901 keV level were doubled to obtain the χ^2 value below normalized $\chi^2=1.33$. Yet 892.85 γ from 4835, 569.67 γ from 4901, 2776.82 γ from 5716, and 1223.35 γ from 6125 yield poor fit including aforementioned γ rays.

[‡] From 1986G106 (α ,p γ).

[§] From 1976Mo27 - (p,p'),(p,p' γ).

Weighted average of data from (1976Mo27 - (p,p')) and (1986G106 - (α ,p γ)).

@ From 1989Se01 (pol p,p'), based on measured angular distributions and analyzing power.

& Assignment in 2012Ma14 (n, γ),(n,n):res, based on R-matrix analysis.

a From (e,e'), based on form factors, γ decay and shell model calculations.

b Assignment in 2012Ma14 (n, γ),(n,n):res, based on R-matrix analysis.

c From 1986G106 (α ,p γ), except otherwise noted.

d Deduced by evaluators from Γ_0 in 1984Be26 - (γ , γ').

 $\gamma(^{26}\text{Mg})$

E(level)	E γ [†]	I γ ^{&}	Mult. ^b	δ	Comments
1808.74	1808.68 4	100	E2		B(E2)(W.u.)=13.4 6.
2938.33	1129.61 4	100.0 6	M1+E2	-0.12 2	δ : From 1963Br15 - (p,p' γ). Other values: -0.16 4 (1975Wa10 - (α , α' ')), -0.11 6 (1977Ki02 - (p,p' γ ')), -0.09 5 (1969Ca18 - (α , α' ')). B(M1)(W.u.)=0.096 6; B(E2)(W.u.)=6.1 21. B(E2)(W.u.)=0.39 4.
	2938.15 5	10.7 6	E2		
3082.9	1274.1 [§] 20	100			
3420.2	1611.4 [§] 17	100	D+Q [§]		
3564.9	1756.1 [§] 19	100			
3588.56	1779.74 8	100	E2		B(E2)(W.u.)=1.07 8.
3941.57	1003.25 4	100.0 16	M1+E2	-0.05 4	B(M1)(W.u.)=0.0162 24; B(E2)(W.u.)=0.23 +37-22. δ : Weighted average of -0.06 6 (1968FeZY), -0.04 5 (1974Na22), and -0.05 10 (1975Wa06). B(M1)(W.u.)=0.00104 16.
	2132.71 4	61.3 16	M1		

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Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Mg})$ (continued)

E(level)	$E\gamma^{\dagger}$	$I\gamma^{\&}$	Mult. ^b	δ	Comments
4318.89	1380.88 18	1.85 11			$E\gamma, I\gamma$: From ^{26}Na β^- decay (2005Gr07).
	2510.01 5	100 2	[E2]		B(E2)(W.u.)=4.5 3.
4332.52	1394.28 7	19.3 10			
	2523.69 6	100.0 13			
	4332.2 3	7.6 8	[E2]		B(E2)(W.u.)=0.24 5.
4350.09	409.4 ^e 5	0.041 ^e 25			$E\gamma, I\gamma$: More precise 409.22 γ 20 in ^{26}Na β^- decay (2005Gr07) yield poor fit. Branching from ^{26}Na β^- decay (2005Gr07).
	1411.72 4	93 4	M1+E2	-0.31 6	B(M1)(W.u.)=0.033 9; B(E2)(W.u.)=9 4.
	2541.18 6	100 4	M1+E2	-0.10 4	δ : From 1974Na22. Other value: -0.31 16 (1975Wa10). B(M1)(W.u.)=0.0066 18; B(E2)(W.u.)=0.06 5.
					δ : Weighted average of -0.11 6 (1968FeZY), -0.09 6 (1974Na22).
4644.9	2836.0 ^{\\$} 13	100	D+Q ^{\\$}		
4835.13	485.05 [#] 9	2.77 [#] 5			
	502.73 [#] 9	2.65 [#] 4			$I\gamma$: 2.1 4 in (n, γ).
	892.85 [#] 19	0.26 [#] 4			
	1896.72 5	100.0 [#] 4	M1		B(M1)(W.u.)=0.096 21.
	3026.6 [#] 5	4.19 [#] 15			$I\gamma$: 4.8 5 in (n, γ).
	4834.61 18	10.8 [#] 9	E2		$I\gamma$: 13.1 12 in (n, γ). B(E2)(W.u.)=0.15 4.
4901.44	551.28 [#] 13	1.61 [#] 14			
	569.67 [#] 25	0.67 [#] 11			
	582.46 [#] 21	0.88 [#] 18			
	958.81 [#] 12	3.9 [#] 5			
	1962.99 [#] 24	1.89 [#] 14	[E2]		B(E2)(W.u.)=2.5 6.
	3092.31 11	100 1	[E2]		B(E2)(W.u.)=14 3.
4972.30	2033.88 12	100 4	E2		B(E2)(W.u.)=7.4 13.
	3163.35	8 ^a 4	E2		B(E2)(W.u.)=0.06 4.
5180.5	1238.9 ^{\\$} 7	100			
5291.74	456.0 [#] 4	1.9 [#] 7			
	1350.20 16	3.4 7	[M1]		B(M1)(W.u.)>0.026.
	2353.27 5	100.0 14			
	3482.2 5	6.6 9			$E\gamma$: Weighted average of data from (n, γ) and ^{26}Na β^- decay (2005Gr07).
	5291.1 5	3.9 7	E2		B(E2)(W.u.)>0.10.
5476.05	640.5 [#] 3	19 [#] 6			
	1157.23 6	100 4	M1+E2	+0.09 7	B(M1)(W.u.)=0.34 10; B(E2)(W.u.)=12 +19-11.
					δ : From 1975Wa10. Other: +0.05 19 (1974Na22).
	1534.49 15	51 4	M1+E2	-0.27 4	B(M1)(W.u.)=0.071 22; B(E2)(W.u.)=12 5.
					δ : From 1974Na22. Other: -0.27 15 (1975Wa10).
	3667.4 5	25 2	[E2]		$E\gamma$: Weighted average of data from (n, γ) and ^{26}Na β^- decay (2005Gr07).
					B(E2)(W.u.)=1.1 4.
5691.08	1358.4 9	6 2			
	2752.56 25	46 3			
	3882.0 3	100 5			
	5691.1 9	11 3	D		
5711.2	2122.5 ^{\\$} 8	100			
5715.91	240.12 [#] 11	2.16 [#] 17			
	424.3 [#] 3	0.38 [#] 9			
	1365.54 20	95.1 [#] 4	M1+E2	-0.17 3	B(M1)(W.u.)=0.036 10; B(E2)(W.u.)=3.1 14.
					δ : Weighted average of -0.18 3 (1974Na22), -0.05 12 (1975Wa10).
	1384.70 [#] 16	4.41 [#] 17			
	1774.0 9	100 5	M1+E2	-0.12 4	B(M1)(W.u.)=0.017 5; B(E2)(W.u.)=0.4 2.
					δ : From 1974Na22.
	2776.82 20	51.4 [#] 14	[E2]		B(E2)(W.u.)=1.7 5.
	3906.8 [#] 7	3.35 [#] 22			
6125.47	409.4 ^e 5	0.10 ^e 5			$E\gamma, I\gamma$: More precise 409.22 γ 20 in ^{26}Na β^- decay (2005Gr07) yield poor fit. Branching from ^{26}Na β^- decay (2005Gr07).

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Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Mg})$ (continued)

E(level)	$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\&}$	Mult. ^b	δ	Comments
6125.47	833.47 21	3.4 4			E_{γ} : Unweighted average of data from (n, γ) and ^{26}Na β^- decay (2005Gr07).
	1223.35 [#] 15	1.3 3			
	1290.40 7	5.2 4			
	1775.31 5	100.0 14	[M1]		B(M1)(W.u.)=0.20 9.
	1792.87 12	6.5 6			
	2183.83 6	13.7 7			
	3187.14 28	5.8 6			
	4316.39 24	4.8 6			
6256.2	565.1 ^{\\$} 13	8 4	D		
	4447.1	100 4	E2		B(E2)(W.u.)=1.2 8.
6483.2	1302.7 ^{\\$} 13				
6622.94	1146.9 ^{\ddagger}	19 ^a 2	[M1]		B(M1)(W.u.)=0.063 18.
	1721.39 [#] 20	100 [#] 4	M1 (+E2)	-0.26 ^d +60-10	B(M1)(W.u.)=0.09 4; B(E2)(W.u.)=12 +52-8.
	2272.7 [#] 3	43.8 [#] 18			
	2290.2 [#] 3	26.2 [#] 14	[E2]		B(E2)(W.u.)=12 4.
	2304.2 [#] 3	37.6 [#] 18			I_{γ} : Other: 23 4 (α ,p γ).
	4813.7 [#] 10	3.8 [#] 5			
6634.2	3695.63 25	100 1			
	4825.0 ^{\ddagger}	6 ^a 1			
6745.13	1453.16 [#] 17	24 [#] 4			E_{γ} : Weighted average of data from (n, γ) and ^{26}Na β^- decay (2005Gr07).
	3807.0 5	100 [#] 6			I_{γ} : Other: 59 6 (n, γ).
	4936.3 3	99 [#] 8			
	6743.9 [#] 21	1.9 [#] 5			
6876.42	2041.44 16	4.7 6			
	2543.7 4	6.1 9			
	2557.2 3	4.4 4			
	2934.8 6	4.2 9	[E1]		B(E1)(W.u.)=1.1 $\times$ 10 ⁻⁵ 5.
	3937.80 11	26.2 12			
	5067.13 4	100.0 19			
6951.7	1771.1 ^{\\$} 14	100			
6971.8	3030.0 ^{\\$} 20	100	D+Q ^{\\$}		
6978.3	1263.7 ^{\\$} 21	8 2			
	1501.8 ^{\\$} 10	100 8	M1+E2	-0.21 ^d 5	B(M1)(W.u.)=0.22 9; B(E2)(W.u.)=24 15.
	2076.8	22 4	M1+E2	-1.0 ^d 6	B(M1)(W.u.)=0.010 7; B(E2)(W.u.)=13 9.
	2628.1	9 2	[E2]		B(E2)(W.u.)=3.2 14.
	2660.0 ^{\\$} 20	34 4	M1+E2	-0.4 ^d 2	B(M1)(W.u.)=0.012 5; B(E2)(W.u.)=1.5 12.
	3036.5	28 4	E2		B(E2)(W.u.)=4.8 19.
7061.90	3472.9 3	94 8	[E1]		B(E1)(W.u.)>0.00089.
	4122.9 6	28 6			
	5252.9 3	56 8	[E1]		B(E1)(W.u.)>0.00015.
	7060.6 7	100 14			
7099.68	2264.25 21	40 6			
	3158.4 6	18 4			
	4160.96 20	100 10			
	5290.3 5	32 4			
	7098.9 5	10 4			I_{γ} : Other: 26 4 - ^{26}Na β^- decay (2005Gr07).
7246.49	1953.6 [#] 7	11 [#] 5			
	2411.5 [#] 3	100 [#] 4			I_{γ} : Other: 40 8 (α ,p γ).
	2896.4 [#] 4	97 [#] 5			
	2913.7 [#] 4	59 [#] 4			I_{γ} : Other: 100 16 (α ,p γ).
	2927.2 [#] 5	22 [#] 3			I_{γ} : Other: 76 16 (α ,p γ).
	3304.6 [#] 5	51 [#] 3			I_{γ} : Other: 96 16 (α ,p γ).
	4308.1 [#] 8	42 [#] 3			
	5436.1 [#] 13	3.6 [#] 7			
7261.40	2426.09 6	25.1 8			
	2911.12 19	8.0 6			
	2928.56 17	9.4 6			
	3319.66 5	47.4 18			
	4322.68 8	15.2 8			
	5452.03 4	100.0 25			

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Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Mg})$ (continued)

E(level)	$E\gamma^{\dagger}$	$I\gamma^{\&}$	Mult. ^b	δ	Comments
7282.82	1567.06 11	9.2 8			
	2381.28 15	10.2 10			
	2932.5 4	18.2 20			
	2963.61 9	62 4	(E1+M2)	+0.5 4	B(E1)(W.u.)=0.00031 15; B(M2)(W.u.)=40 +60-30.
	3341.01 7	100 4	[E1]		B(E1)(W.u.)=0.00043 15.
7348.86	1873.1 5	1.5 4			
	2513.52 8	42 3			
	3016.18 23	11.9 12			
	3029.6 8	3.2 4			
	4410.15 5	100 4			
7371.36	5539.53 15	31.5 19			
	1245.68 [#] 24	38 [#] 5			
	2080.0 [#] 6	5.1 [#] 16			
	3021.9 4	27 4			$E\gamma$: Weighted average of data from (n, γ) and ^{26}Na β^- decay (2005Gr07).
	3039.1 [#] 5	6.3 [#] 10			$E\gamma$: Other: 3430.2 5 (2005Gr07) - ^{26}Na β^- decay.
7396.0	3428.7 4	100 15			
	5562.9 9	27 4			
	7369.8 7	54 15			
	1680.0 ^{\S} 10	100 6	(M1+E2)	-0.14 2	B(M1)(W.u.)>0.16; B(E2)(W.u.)>4.6.
	2494.4	36 4			
7541.71	3045.7	26 2			
	3076.9	14 4			
	3454.2	24 2			
	3191.2 6	8.7 11			
	3208.98 8	100 4			
7677	3599.86 14	38 3			
	4602.93 7	84 4			
	5732.37 15	39 3			
	1551.5	35 4			
	1961.0	100 8			
7696.8	2775.4	44 6			
	3357.9	29 4			
	4757.6 [@]	37 [@] 13			
	5887.9 [@]	17 [@] 5			
	7695.6 8	100 [@] 31			
7725.8	3406.9 [#] 5	100 4			
	3783.7 [#] 7	19 4			$I\gamma$: Other: 50 7 - (2005Gr07) - ^{26}Na β^- decay.
	5915.5 [#] 16	20 [#] 4			
	2297.5	30 8			
	2938.4	30 8			
7773.7	3454.7 [#] 9	20 6			
	3831.7 [#] 7	100 14			
	4834.9	20 6			
	3485.0 [#] 7	100 [#] 15			
	6008.7 [#] 16	67 [#] 9			
7824	3882	100 13			
	4885	100 13			
	6015	50 10			
	3521	47 10			
	4251	100 12	E2		
7840	4901	63 12			
	6030.5	23 7			
	2234.0 ^{\S} 20	47 5	E1+M2	-0.19 15	B(E1)(W.u.)=0.0015 7; B(M2)(W.u.)=50 +80-40.
	3633.8 ^{\S} 10	100 5	E1+M2	+0.13 11	B(E1)(W.u.)=0.0008 4; B(M2)(W.u.)=5 +8-4.
	5095	100			
8034	6242.9 7	100			
	5245.9 3	28 4			
	6375.38 16	100 4			
	8201.1	44 4	p^d		
	3299.5 10	78 7			
8052.4	3881.8 10	100 9			
	8227.31	85 6			
	6417.9 3				

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Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Mg})$ (continued)

E(level)	$E\gamma^{\dagger}$	$I\gamma^{\&}$	Mult. ^b	δ	Comments
8227.31	8225.6 4	100 6			
8250.58	5311.66 16	100 6			
	6441.1 8	3.9 8			
8458.9	4139.7 5	55 8			
	6649.1 7	100 6			
8464	4144.8	100			
8472.3	1494.0 [§] 14	38 5	D+Q ^d	-0.32 ^d 10	
	3570.6	100 6			
	4153.1	21 3			
8503.7	6694.0 7	39 6			
	8502.2 3	100 6			
8532.1	4181.9 7	66 11			
	5593.2 4	100 13			
	6722.1 7	47 9			
8625	2002	100 4	E1+M2	+0.03 ^d 1	B(E1)(W.u.)=0.0028 6; B(M2)(W.u.)=2.9 21.
	4305.7	18 4	E1 ^c		B(E1)(W.u.)=5.1×10 ⁻⁵ 16.
8670	3193.7	54 8	D+Q	<+0.5	δ : also, >-0.5. Measured values: +0.35 15 (for J=3); -0.13 +7-26 (for J=5).
	4350.7	100 8	D+Q	<+0.13	δ : also, >-0.13. Measured values: +0.03 +3-9 (for J=3); +0.09 +4-9 (for J=5).
8705.6	3229.3	29 ^a 7			
	4355.3 6	12 3			$E\gamma, I\gamma$: γ -ray energy from (n, γ). Branching normalized to $I\gamma$ of 5766 γ in 1992Wa06 and ($\alpha, p\gamma$).
	4386.3	100 ^a 11			
	4763.6	64 ^a 9			
	5766.6 3	29 ^a 7			
8863.8	5924.8 4	69 8			
	7054.0 6	100 8			
8903.52	1554.8 4	7.9 14			
	1620.8 3	21 2			
	1642.09 25	22 2			
	3611.5 4	30 3			
	4001.8 3	30 3			
	4553.02 13	100 7			
	4961.42 22	97 7			
	5964.31 20	36 3			
8930	2307	50 11			
	3214	100 14			
	3453.7	75 14			
	4987.9	53 11			
8959.4	7149.4 [@]	64 [@] 7			
	8957.7 5	100 [@] 12			
9020	4701	100			
9043.4	6104.3 9	100			
9064	1668	26 5	D+Q ^d	+0.6 ^d 4	
	4162	26 5			
	4744.7	100 8	D ^d		
9111.2	1715	16 ^a 4	[M1]		B(M1)(W.u.)>0.032.
	2488	16 ^a 4	[E2]		B(E2)(W.u.)>9.4.
	3635	100 ^a 12	[E2]		B(E2)(W.u.)>8.8.
	4209.4	32 ^a 6	[E2]		B(E2)(W.u.)>1.4.
	4792	36 ^a 6	[E2]		B(E2)(W.u.)>0.80.
9139.5	9137.8	100			
9169	1218.7 [§] 23	100 ^a 7	M1+E2 ^c	-0.14 ^d 6	B(M1)(W.u.)=0.25 8; B(E2)(W.u.)=18 17.
	1773	39 ^a 6	E1+M2 ^c	+0.07 ^d 5	B(E1)(W.u.)=0.0011 4; B(M2)(W.u.)=8 +12-7.
	1886	24 ^a 4	[E2]		B(E2)(W.u.)=26 10.
	2190.6	22 ^a 4	[E1]		B(E1)(W.u.)=0.00034 13.
9206	4887	100			
9238.9	5649.5 [@]	23 [@] 5			
	9237.1 8	100 [@] 20	M1		B(M1)(W.u.)=0.072 9.
9261	5319	100			
9291	7481	100			
9304	4985	100			

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Mg})$ (continued)

E(level)	$E\gamma^{\dagger}$	$I\gamma^{\&}$	Mult. ^b	δ	Comments
9316	4983	100			
9325.57	4424.2 8	27 4			
	4489.4 9	27 4			
	4975.3 9	32 5			
	4992.4 8	48 5			
	5383.8 7	16 3			
	6386.34 23	100 8			
9371	5429	100			
9383	1182	15 ^a 3			
	2404.6	74 ^a 10	D+Q ^d	-0.14 ^d 6	
	2759.9	38 ^a 5	Q ^d		
	3666.8	100 ^a 13	Q ^d		
	5063.6	28 ^a 5			
9427.8	5077.4 9	23 6			
	6488.6 4	100 8			
	7617.8 7	33 5			
9471	5529	100			
9540.3	2562	5.3 ^a 16	D ^d		
	3824.0 ^s 20	23 ^a 3			
	4638.4	34 ^a 7			
	5221.0 ^s 20	100 ^a 10	D+Q ^d	+0.06 ^d 5	
9563.5	7753.1 [@]	49 [@] 11			
	9561.6 [@]	100 [@] 21	M1		
9574.06	2290.8 4	14.0 24			
	2697.7 3	24.4 24			
	3448.8 7	20.7 24			
	5223.37 12	100 9			
	5632.3 6	14.6 18			
9590	6651	100 ^a 13			
	7780	67 ^a 13			
9617.0	7807.0 9	100			
9681	7871	100			
9770.8	7961.1 [@]	69 [@] 14			
	9768.8 [@]	100 [@] 19			
9771	4869	100 ^a 16			
	5452	100 ^a 16			
9814	5495	100			
9829.5	1357.2	6.7 ^a 11			
	1628.3 ^s 12	100.0 ^a 22	M1 (+E2)	<+0.24	δ : also, >-0.24. Measured values: +0.19 +5-11 (for $J\pi=5+$); -0.03 +1-4 (for $J\pi=7+$). B(M1)(W.u.)>0.084; B(E2)(W.u.)<18.
	2433.4	5.6 ^a 11			
9856.8	5020.7 8	62 10			
	5523.6 7	100 12			
	5915.8 9	31 10			
	9854.5 7	43 10			
9900.3	6961	100			
9927	5025	100			
9939	5619	100			
9967	5065	100 ^a 9			
	7028	67 ^a 9			
9982	6040	100			
9989	1517	25 ^a 4	(M1+E2) ^d	-0.17 ^d 10	B(M1)(W.u.)>0.15.
	3011	100 ^a 7	(M1+E2) ^d	-0.09 ^d 5	B(M1)(W.u.)>0.078.
	5669.5	20 ^a 4	[E2]		B(E2)(W.u.)>0.42.
10040	4323.7	100 ^a 13			
	5138.0	51 ^a 9			
	5720.4	71 ^a 9			
10069	5167	100			
10102.5	7162.4 9	35 9			
	10100.5 4	100 13			
10126.7	7187.4 8	52 9			
	8316.4 8	100 13			

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Mg})$ (continued)

E(level)	$E\gamma^\dagger$	$I\gamma^\&$	Mult. ^b	E(level)	$E\gamma^\dagger$	$I\gamma^\&$
10147.1	8337.9@	43@ 3		10707	4991	100
	10145.0@	100@ 9	M1	10767	6416	100 ^a 9
10184	5282	100			7827	45 ^a 9
10219.9	8409.7 9	100		10805.9	8995.5 4	100@ 12
10234	5332	100			10803.3	28@ 8
10319.5	7378.4@	67@ 19		10945	1562	16 ^a 4
	10317.3@	100@ 22	M1		1776	100 ^a 9
10349.4	8539.2 9	100			2320	48 ^a 7
10362.26	3261.8 4	62 5		10949.1	6615.6	18.9@ 18
	4886.3 5	46 8			7359.4	8.2@ 13
	6011.2 5	49 8			8009.4	23.7@ 23
	8552.2 3	100 10			9138.7	100@ 6
10377	4661	100			10946.6	24@ 4
10529	4813	100 ^a 17		11012	6110	61 ^a 12
	6196	67 ^a 17			6692	100 ^a 12
10573.3	5600.4	100@ 17		11153.5	6180.4	14@ 4
	10571.0	89@ 19			6820.0	11.2@ 16
10576	2044	85 ^a 8			7563.8	16@ 4
	3597	100 ^a 8			9343.0	4.2@ 6
10600.1	3500.6 9	0.06 2			11150.9	100@ 12
	6249.7 9	31 8		11191	3241	72 ^a 14
	6267.0 6	100 17			5474	100 ^a 14
	6657.3 5	86 17		11329.11	3933	100 ^a 8
	7660.4 9	39 6			4350	56 ^a 8
10647.3	3547.4	1.41@ 14		11457	6555	100
	5355.0	1.84@ 15		11570	3098	100 ^a 15
	5674.4	1.84@ 15			4174	82 ^a 15
	7707.7	7.3@ 4		12088	4692	79 ^a 15
	8837.0	1.76@ 21			5109	100 ^a 15
	10645.0	100@ 4	M1	12196	3723	45 ^a 8
10650	1481	56 ^a 8			3995	100 ^a 8
	3254	100 ^a 8		12479	2649	100 ^a 10
10693	3297	100			4278	64 ^a 10

[†] From (n, γ), except otherwise noted.

[‡] From level energy differences. Recoil energy subtracted.

[§] From ($^{13}\text{C},\alpha\gamma$).

From ^{26}Na β^- decay (2005Gr07).

@ From (pol γ,γ'), (γ,γ').

& Relative photon branching from each level.

^a γ -ray branching from (α,γ) 1986G106.

^b Based on reported mixing ratio and RUL. Details are noted as comments.

^c From (α,γ) and recommended upper limits for γ -ray transition strengths.

^d From (α,γ) – 1986G106.

^e Multiply placed; intensity suitably divided.

 ^{26}Na β^- Decay 2005Gr07,1973Al13,1973K109

Parent ^{26}Na : E=0.0; $J\pi=3+$; $T_{1/2}=1.07128$ s 25; Q(g.s.)=9354 4; % β^- decay=100.

$^{26}\text{Na}-T_{1/2}$: From measurement by 2005Gr07: 1.07128 s 13 21, the first uncertainty is statistical, the second is systematic and the two are combined in quadrature.

Other ref: 2005Wi20.

2005Gr07: ^{26}Na was produced by bombarding silicon-carbide and tantalum targets with 500-MeV protons. Mass separation was done at ISAC facility in TRIUMF. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$ using 8 π array of 20 Compton-suppressed HPGe detectors. A 4 π proportional counter and fast tape transport system were employed for half-life measurement.

1973Al13: ^{26}Na was produced from $^{10}\text{B}(^{18}\text{O},2p)$ reaction, E=42 MeV; also from $^{18}\text{O}(^{13}\text{C},p\alpha)$, E=35 MeV, reaction. β and γ rays were detected with NE102 and Ge(Li) detectors. Measured $E\gamma$ and $I\gamma$. Deduced half-life of ^{26}Na .

1973K109: ^{26}Na was produced from $^{26}\text{Mg}(n,p)$ reaction, enriched ^{26}Mg target; measured $E\gamma$, $I\gamma$, half life; deduced log ft , excited levels, spin and parity.

^{26}Na β^- Decay 2005Gr07,1973Al13,1973Kl09 (continued) ^{26}Mg Levels

<u>E(level)[†]</u>	<u>Jπ</u>	<u>E(level)[†]</u>	<u>Jπ</u>	<u>E(level)[†]</u>	<u>Jπ</u>
0.0	0+	4834.92 17	2+	6744.90 23	2+
1808.81 16	2+	4901.16 18	4+	7099.1 6	2+
2938.26 17	2+	5291.65 17	2+	7246.15 21	3+
3941.48 17	3+	5475.59 19	4+	7371.27 24	2+
4319.17 19	4+	5715.93 18	4+	7726.0 5	3+
4332.02 17	2+	6125.00 17	3+	7773.7 6	4+
4350.02 17	3+	6622.77 21	4+	7817.4 7	(2,3)+

[†] From least-squares fit to $E\gamma$. Doubled uncertainties for 958.81 γ from 4901, 1384.70 γ and 240.12 γ from 5715 keV level were used during the fit and yields $\chi^2=3.3$. $\chi^2(\text{critical})=1.5$. $\chi^2=5.3$ without increased uncertainty. Poorly fitted γ rays flagged.

 β^- radiations

<u>Eβ^-</u>	<u>E(level)</u>	<u>Iβ^-[†]</u>	<u>Log ft</u>	<u>Eβ^-</u>	<u>E(level)</u>	<u>Iβ^-[†]</u>	<u>Log ft</u>
(1537 4)	7817.4	0.0023 10	6.2 2	(3878 4)	5475.59	0.0027 12	7.9 2
(1580 4)	7773.7	0.0024 7	6.3 1	(4062 4)	5291.65	0.0129 18	7.31 6
(1628 4)	7726.0	0.0035 7	6.2 1	(4453 4)	4901.16	0.246 11	6.21 2
(1983 4)	7371.27	0.0608 22	5.27 2	(4519 4)	4834.92	2.378 19	5.25 1
(2108 4)	7246.15	0.0507 16	5.46 2	(5004 4)	4350.02	3.17 7	5.33 1
(2255 4)	7099.1	0.0028 9	6.8 1	(5022 4)	4332.02	1.65 3	5.62 1
(2609 4)	6744.90	0.0414 20	5.95 2	(5035 4)	4319.17	0.493 11	6.15 1
(2731 4)	6622.77	0.0607 12	5.87 1	(5413 4)	3941.48	1.31 4	5.87 1
(3229 4)	6125.00	1.72 4	4.74 1	(6416 4)	2938.26	0.05 4	7.6 4
(3638 4)	5715.93	0.94 4	5.23 2	(7545 4)	1808.81	87.80 7	4.71 1

[†] Absolute intensity per 100 decays.

 $\gamma(^{26}\text{Mg})$

I γ normalization: $\Sigma(I\gamma\text{'s to g.s.})=100$, assuming no β^- to g.s. (3+ to 0+).

<u>Eγ[†]</u>	<u>E(level)</u>	<u>Iγ^{§@}</u>	<u>Mult.[‡]</u>	<u>$\delta^{\ddagger}$</u>	<u>α</u>	<u>Comments</u>
240.12 11	5715.93	0.0080 6				
409.22 [#] & 20	4350.02	0.0010& 6				
	6125.00	0.0012& 6				
424.3 3	5715.93	0.0014 3				
456.0 4	5291.65	0.0012 4				
485.05 9	4834.92	0.0575 9				
502.73 9	4834.92	0.0550 8				
551.28 13	4901.16	0.0046 4				
569.67 25	4901.16	0.0019 3				
582.46 21	4901.16	0.0025 5				
640.5 3	5475.59	0.0014 4				
833.26 10	6125.00	0.0501 8				
892.85 [#] 19	4834.92	0.0053 7				
958.81 [#] 12	4901.16	0.0110 13				
1002.61 [#] 12	3941.48	1.282 8	M1+E2	-0.05 4		E γ : Other: 1002.9 5 (1973Al13), 1002.61 12 (2005Gr07).
1120.74 24	7246.15	0.0074 11				
1128.89 [#] 13	2938.26	5.93 3	M1+E2	-0.12 2		
1155.85 [#] 17	5475.59	0.0074 9	M1+E2	+0.09 7		
1223.35 [#] 15	6125.00	0.0325 11				
1245.68 24	7371.27	0.0074 9				
1289.88 14	6125.00	0.0890 12				
1349.4 4	5291.65	0.0026 6				
1365.21 [#] 15	5715.93	0.3517 15	M1+E2	-0.17 3		
1380.88 18	4319.17	0.0095 6				
1384.70 [#] 16	5715.93	0.0163 6				
1393.83 15	4332.02	0.2878 11				

Continued on next page (footnotes at end of table)

^{26}Na β^- Decay 2005Gr07,1973Al13,1973Kl09 (continued) $\gamma(^{26}\text{Mg})$ (continued)

$E\gamma^{\dagger}$	E(level)	$I\gamma^{\S@}$	Mult. ‡	$\delta^{\ddagger}$	α	Comments
1411.36 19	4350.02	2.466 7	M1+E2	-0.31 6		E γ : Weighted average of 1411.32 16 (2005Gr07) and 1412.3 8 (1973Al13).
1453.16 17	6744.90	0.0044 6				
1721.39 20	6622.77	0.0290 10				
1775.08# 20	5715.93	0.37 4	M1+E2	-0.12 4	1.61×10^{-4} 2	
	6125.00	1.20 4				
1792.90 20	6125.00	0.0795 12				
1808.71 20	1808.81	100	E2		2.28×10^{-4}	
1896.78 22	4834.92	2.074 7	M1 (+E2)	-0.04 6	2.07×10^{-4}	E γ : Other: 1896.7 6 (1973Al13).
1953.6 7	7246.15	0.0012 5				
1962.99 24	4901.16	0.0054 4				
2080.0 6	7371.27	0.0010 3				
2132.91 25	3941.48	0.637 7	M1 (+E2)	+0.01 2	3.02×10^{-4}	E γ : Other: 2133.0 10 (1973Al13).
2184.1 3	6125.00	0.1807 22				
2272.7 3	6622.77	0.0127 5				
2290.2 3	6622.77	0.0076 4				
2304.2 3	6622.77	0.0109 5				
2353.7 3	5291.65	0.0626 12				E γ : Other: 2353 (1973Al13).
2411.5 3	7246.15	0.0113 4				
2510.5 3	4319.17	0.514 11				E γ : Weighted average of 2510.5 3 (2005Gr07) and 2509.8 8 (1973Al13).
2523.9 3	4332.02	1.43 3				E γ : Weighted average of 2524.1 3 (2005Gr07) and 2523.3 6 (1973Al13).
2541.5 3	4350.02	2.39 5	M1+E2	-0.10 4	4.74×10^{-4}	E γ : Weighted average of 2541.6 3 (2005Gr07) and 2541.0 6 (1973Al13).
2777.7 4	5715.93	0.190 5				
2896.4 4	7246.15	0.0110 5				
2913.7 4	7246.15	0.0067 4				
2927.2 5	7246.15	0.0025 3				
2938.6 4	2938.26	0.570 19				
3022.0 4	7371.27	0.0124 5				
3026.6 5	4834.92	0.087 3				
3039.1 5	7371.27	0.00124 18				
3092.8 4	4901.16	0.285 11	E2		8.27×10^{-4}	E γ : Other: 3092 (1973Al13).
3187.3 5	6125.00	0.0426 18				
3304.6 5	7246.15	0.0058 3				
3406.9 5	7726.0	0.00209 17				
3430.2 5	7371.27	0.0197 9				
3454.7 9	7773.7	0.00034 12				
3482.0 7	5291.65	0.00246 25				
3485.0 7	7817.4	0.00137 20				
3667.5 6	5475.59	0.00195 18				
3783.7 7	7726.0	0.00104 13				
3806.7 6	6744.90	0.0186 11				
3831.7 7	7773.7	0.00207 19				
3906.8 7	5715.93	0.0124 8				
4160.6 8	7099.1	0.00175 21				
4308.1 8	7246.15	0.0048 3				
4316.3 8	6125.00	0.072 5				
4332.1 9	4332.02	0.115 8				
4813.7 10	6622.77	0.00110 14				
4834.3 10	4834.92	0.225 17	E2		1.44×10^{-3}	
4936.1 11	6744.90	0.0184 14				
5289.4 8	7099.1	0.00066 14				
5290.8 3	5291.65	0.00234 23	E2		1.57×10^{-3}	E γ : Unresolved doublet with 5289.4 (placement from 7099 level - (2005Gr07).
5436.1 13	7246.15	0.00041 8				
5561.6 14	7371.27	0.0065 6				
5915.5 16	7726.0	0.00042 8				
6008.7 16	7817.4	0.00092 12				
6743.9 21	6744.90	0.00035 8				
7099.0 24	7099.1	0.00046 7				
7369.8 25	7371.27	0.0131 15				

Footnotes continued on next page

^{26}Na β^- Decay 2005Gr07,1973Al13,1973Kl09 (continued) $\gamma(^{26}\text{Mg})$ (continued)† From Adopted Gammas. γ -ray energies from 2005Gr07 and/or 1973Al13 are listed in comments section.

‡ From Adopted Gammas.

§ From 2005Gr07.

Poorly fitted γ rays, differ by 3 or more sigma from calculated values.

@ For absolute intensity per 100 decays, multiply by 0.9908 3.

& Multiply placed; intensity suitably divided.

Decay Scheme

Intensities: I(γ +ce) per 100 parent decays

@ Multiply placed; intensity suitably divided

^{26}Na β^- Decay 2005Gr07,1973Al13,1973Kl09 (continued)

Decay Scheme (continued)

^{26}Al ϵ Decay (7.17×10^5 y) 1972Sa02

Parent ^{26}Al : E=0.0; $J\pi=5+$; $T_{1/2}=7.17 \times 10^5$ y 24; Q(g.s.)=4004.14 6; % ϵ +% β^+ decay=100.

^{26}Al was a solution of $\text{Al}(\text{NO}_3)_3$ with a nominal activity of 0.045 μCi evaporated to dryness as Al_2O_3 ; The powder residue was mounted on a plastic disk; Ge(Li) detector; Measured E_γ , I_γ ; Deduced decay scheme.

 ^{26}Mg Levels

E(level) [†]	$J\pi$	$T_{1/2}$
0.0	0+	stable
1808.72 7	2+	476 fs 12
2938.41 13	2+	141 fs 8

[†] From γ -ray energy.

 β^+, ϵ Data

From I(γ +ce) intensity balance at each level.

E ϵ	E(level)	$I\beta^+$	I ϵ	Log ft	I(ϵ + β^+)
(1065.73 15)	2938.41		2.74 20	14.59 ^{2u} 4	2.74 20
(2195.42 10)	1808.72	81.73 21	15.51 13	15.721 ^{2u} 15	97.24 20

^{26}Al ϵ Decay (7.17×10^5 y) 1972Sa02 (continued) $\gamma(^{26}\text{Mg})$

I_γ normalization: From sum of $I(\gamma+\epsilon)$ (to g.s.)=100% (ϵ feeding to g.s. is not expected, $\Delta J=5$).

$E\gamma^\dagger$	E(level)	$I_\gamma^{\dagger\ddagger}$	Mult.	δ	α
1129.67 10	2938.41	2.5 2	M1+E2	-0.12 2	
1808.65 7	1808.72	99.76 4	E2		2.28×10^{-4}
2938	2938.41	0.24 4	E2		7.60×10^{-4}

† From 1972Sa02.

‡ Absolute intensity per 100 decays.

Decay Scheme

Intensities: $I(\gamma+\epsilon)$ per
100 parent decays

^{26}Al ϵ Decay (6.3460 s) 2012Fi06

Parent ^{26}Al : $E=228.305$ 13; $J\pi=0+$; $T_{1/2}=6.3460$ s 8; $Q(\text{g.s.})=4004.43$ 6; $\% \epsilon + \% \beta^+$ decay=100.

Others: 2011Fi01, 1989Sk02, 1987Wi06, 1983Va01, 1969De27.

2012Fi06, 2011Fi01: Proton beam, $E=500$ MeV, bombarded SiC (thickness 14.35 g/cm²) target. Triumf Resonant Ionization Laser Ion Source use to ionize aluminum isotopes selectively. A 30-keV ion beam of separated products ($A=26$) was implanted into a aluminized mylar tape and allowed to cool for 26–34 seconds to reduce the amount of ^{26}Na . The detection system was a 4 π continuous-flow gas proportional counter. The half-life of the 228-keV, 0+ isomeric state was measured from the decay curve using maximum likelihood method.

 ^{26}Mg Levels

E(level)	$J\pi$	$T_{1/2}$
0.0	0+	stable

 β^+, ϵ Data

$E\epsilon$	E(level)	$I\beta^{+\dagger}$	$I\epsilon^\dagger$	Log ft	$I(\epsilon+\beta^+)^\dagger$
(4232.73 7)	0.0	99.9176 9	0.0824 9	3.48281 6	100

† Absolute intensity per 100 decays.

^{27}Na β^- n Decay 1984Gu19

Parent ^{27}Na : $E=0$; $J\pi=5/2+$; $T_{1/2}=301$ ms 6; $Q(\text{g.s.})=2626$ 4; $\%\beta^-$ n decay=0.13 4.

$^{27}\text{Na}-\beta^-$ n decay: Deduced in 1984Gu19 from 1808.68 γ activity.

1984Gu19: ^{27}Na was produced in the fragmentation of iridium target by 10 GeV protons from the CERN synchrotron.

Recoiled fragments were thermalized, ionized and mass-separated; Ge(Li) detector, Measured: $E\gamma$, $I\gamma$, $\beta-\gamma\gamma$ coin.

^{26}Mg Levels

E(level)	$J\pi$	$T_{1/2}$
0.0	0+	stable
1808.70 6	2+	

$\gamma(^{26}\text{Mg})$

$E\gamma$	E(level)	$I\gamma^\dagger$	Mult.	Comments
1808.68 6	1808.70	0.13 4	E2	$E\gamma$: From 1984Gu19. $I\gamma$: Deduced by evaluators from $I\gamma=0.150$ 45 relative to $I\gamma=100$ for 984.66 γ and corresponding absolute $I\gamma=87.4$ 6% in ^{27}Mg (2011Ba29 – in ENSDF).

† Absolute intensity per 100 decays.

Decay Scheme

$^{18}\text{O}(^{13}\text{C}, \alpha n\gamma)$ 2014Bh03

Target: Ta_2O_5 (effective ^{18}O thickness ≈ 1.6 mg/cm 2), was prepared heating 50 mg/cm 2 thick Ta foil in enriched ^{18}O ;

Projectile: ^{13}C , $E=30$ MeV; Measured $E\gamma$, $I\gamma$, $\gamma\gamma$ coin, $\gamma(\theta)$, $\gamma\gamma(\theta)$, $\gamma\gamma$ (linear polarization) using an array of 15

Compton-suppressed Clover detectors.

^{26}Mg Levels

E(level) †	$J\pi$	Comments
0.0	0+	
1809.0 8	2+	
2939.3 8	2+	
3083.2 22		
3420.5 19		
3565.2 21		
3588.7 23	0+	
3943.0 10	3+	
4318.4 11	4+	
4332.0 14	2+	
4350.7 9	3+	
4645.2 15		

Continued on next page (footnotes at end of table)

$^{18}\text{O}(^{13}\text{C},\alpha\gamma)$ 2014Bh03 (continued) **^{26}Mg Levels (continued)**

E(level) [†]	J π	Comments
4839.2 13	2+	
4901.2 22	4+	
5181.9 12		
5292.4 22	2+	
5476.6 11	4+	
5691.5 14	1+	
5711.3 24		
5715.5 11	4+	
6125.6 25	3+	
6256.6 19	0+	
6484.7 18		
6622.6 13	4+	
6634.6 22	1+	
6953.1 19	(2)+	J π : From shell model calculations.
6973.2 22	4+	J π : 3030 γ D+Q to 3+ and parity from shell model calculations.
6978.5 13	5+	
7099.7 22	2+	
7261.2 22	2-	
7283.2 22	4-	
7395.5 15	5+	
7543.3 22	2-	
7771.6 23	4+	
7952.6 23	5-	
8201.3	6+	
8472.6 19	6+	
8903.6 24	3-	
9171.4	6-	
9539.9 17	5+	
9830.4	7+	

[†] From a least-squares fit to $E\gamma$. **$\gamma(^{26}\text{Mg})$**

$R(0)=\gamma$ anisotropy ratio for 40°, 65° and 90° geometry. For a $\Delta J=1$, dipole transition, expected ratios are 0.95 and 1.13 for gating on $\Delta J=1$ and $\Delta J=2$ transitions, respectively. Similarly, for a $\Delta J=2$, quadrupole transition, expected ratios are 1.82 and 1.68 for gating on $\Delta J=1$ and $\Delta J=2$ transitions, respectively.

Polarization values are integral polarization asymmetries from oriented nuclei. Expected value is positive for electric and negative for magnetic transitions.

$E\gamma$	E(level)	I_γ	Mult. [†]	δ	Comments
565.1 13	6256.6		D $\S$		
833.1 13	6125.6				
896.0 13	4839.2	2.1 22	M1+E2		$R(0)=1.01$ 1, pol=+0.21 33.
1004.1 16	3943.0	29 8	M1+E2		$R(0)=0.92$ 16, pol=-0.20 6.
1130.4 3	2939.3	100 7	M1+E2	-0.14 5	$R(0)=1.24$ 1, pol=-0.15 4, $A_2=+0.23$ 1, $A_4=-0.07$ 1. δ : Rose-Brink convention used in 2014Bh03. Sign reversed to Krane-Steffen convention for ENSDF policy.
1158.3 12	5476.6	18.6 32	M1+E2 $\S$		$R(0)=1.42$ 7.
1218.7 23	9171	9.5 27	M1+E2 $\S$		pol=-0.66 10.
1238.9 7	5181.9				
1263.7 21	6978.5				
1274.1 20	3083.2				
1302.7 13	6484.7				
1359.4 3	5691.5				
1365.0 11	5715.5		M1+E2 $\S$		
1379.2 11	4318.4				
1411.4 4	4350.7	24.0 30	M1+E2		$R(0)=1.16$ 3, pol=-0.05 6.
1494.0 14	8472.6		M1+E2 $\S$		
1501.8 10	6978.5		M1+E2		$R(0)=0.6$ 8, pol=-0.47 12.
1533.4 8	5476.6	8.0 27	M1+E2		$R(0)=1.19$ 83, pol=-0.12 15.
1611.4 17	3420.5		D+Q		$R(0)=1.08$ 2.

Continued on next page (footnotes at end of table)

$^{18}\text{O}(^{13}\text{C},\alpha\gamma)$ 2014Bh03 (continued) $\gamma(^{26}\text{Mg})$ (continued)

E_γ	E(level)	I_γ	Mult. [†]	Comments
1628.3 12	9830		M1 (+E2) §	
1642.3 7	8903.6			
1680.0 10	7395.5		M1+E2 §	
1756.1 19	3565.2			
1771.1 14	6953.1			
1772.0 11	5715.5		M1+E2 §	
1779.6 21	3588.7		E2	R(θ)=2.2 15, pol=+1.7 28.
1809.2 10	1809.0	259 10	E2 ‡	R(θ)=1.87 4; pol=+0.53 15.
1900.1 20	4839.2	10.0 27	M1 (+E2) §	
2122.5 8	5711.3			
2133.1 10	3943.0	17.1 27	M1 (+E2)	R(θ)=1.11 5, pol=-0.63 55.
2271.8 10	6622.6			
2353.0 20	5292.4			
2509.0 20	4318.4	73 21	(E2) §	R(θ)=1.2 16.
2523.0 20	4332.0	40 53		pol=-0.57 61.
2541.0 20	4350.7		M1+E2 §	pol=-0.34 91.
2660.0 20	6978.5		M1+E2 §	
2752.0 20	5691.5			
2777.0 20	5715.5		[E2] §	
2836.0 13	4645.2		D+Q	R(θ)=1.13 7.
2938.9 10	2939.3		E2 ‡	R(θ)=2.20 17, pol=+1.05 33.
3030.0 20	4839.2			
	6973.2		D+Q ‡	R(θ)=0.95 3.
3092.0 20	4901.2	35.3 34	E2 (+M3)	R(θ)=1.74 4, pol=+0.17 12.
3300.0 20	8201		E2 (+M3) §	
3318.0 20	7261.2		[E1] §	
3340.0 20	7283.2		E1	R(θ)=1.09 1, pol=+0.8 13.
3453.0 20	7771.6			
3600.0 20	7543.3		[E1] §	
3634.0 20	7952.6		E1+M2	R(θ)=1.19 1, pol=+0.8 14.
3667.0 20	5476.6		[E2] §	
3695.0 20	6634.6			
3824.0 20	9539.9			
3882.0 20	5691.5			
4160.0 20	7099.7	8.6 25		
5221.0 20	9539.9		D+Q §	

[†] From R(θ) with gate on ΔJ=2 transition and polarization (pol) values, unless otherwise stated.

[‡] R(θ) value for gate on ΔJ=1 transition.

§ From Adopted Levels.

 $^{22}\text{Ne}(^6\text{Li},\text{d})$ 2007Ug01,1993Gi04

Other: 2014OtZY.

2007Ug01: Target: ^{22}Ne target prepared by implanting a ^{22}Ne beam into a 99.9% enriched ^{12}C foil. Projectile: ^6Li , E=30 MeV; Reaction products separated with Enge split-pole spectrometer. Detected particles using magnetic rigidity and E-δE methods, a gas ionization chamber and a scintillator detector. FWHM=63 keV.

1993Gi04: Target: Enriched ^{22}Ne gas in a 0.13 atm pressurized cell; Projectile: ^6Li , E=32 MeV; Reaction products were momentum analyzed with a broad-range magnetic spectrograph and detected with a position sensitive proportional counter system backed by a scintillator. Focal plane position, energy loss and total energy of reaction products were determined. Deduced resonances, spin and parity, spectroscopic factors, resonance strength. FWHM was about 120 keV. $^{22}\text{Ne}(^6\text{Li},\text{d})$ spectra were collected at 7.5°, 15°, 25°, 35°, and 45°.

 ^{26}Mg Levels

E(level) [†]	$J\pi$ [§]	L [#]	S [@]	Comments
0.0	0+			
9320& 60				E(level): peak $\Gamma=172$ keV 20.
9404 ‡ 20	(4+), 6+		(0.004)	S: 0.013 for $J\pi=6+$.

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$^{22}\text{Ne}(^6\text{Li},d)$ 2007Ug01,1993Gi04 (continued) **^{26}Mg Levels (continued)**

E(level) [†]	$J\pi^{\S}$	L [#]	S [@]	Comments
9586 $\frac{1}{2}^{\&}$ 20	4+	4	0.011	E(level): Other value: 9570 40 with a peak width of 117 keV 15 (2007Ug01). $J\pi$: From L=4 (1993Gi04).
9985 $\frac{1}{2}^{\&}$ 20				
10335 $\frac{1}{2}^{\&}$ 20	(7-)		(0.083)	$J\pi$: Proposed in 1993Gi04, based on best experimental description with an L=7 transfer. Also l-transfer of 5, 6, 7, 8 is possible.
10568 $\frac{1}{2}^{\&}$ 25				
10694 $\frac{1}{2}^{\&}$ 20	4+, 7-, 8+		0.024	$J\pi$: From approximation of L=4,7,8 (1993Gi04). S: 0.067 and 0.40 for $J\pi=7-$ and 8+, respectively (1993Gi04). $J\pi$: natural parity states assumed to be populated in ($^6\text{Li},d$) reaction.
10808 20	0+, 1-, 2+, 3-, 4+			E(level): peak $\Gamma=69$ keV 16.
10953 $\frac{1}{2}^{\&}$ 25				E(level): peak $\Gamma=58$ keV 16 (2007Ug01). $J\pi$: 5-, 6+, 7- from known γ -decay modes in the literature and assuming population of natural-parity states in ($^6\text{Li},d$) reaction (2007Ug01). 1993Gi04 propose 3- with other possibilities of 1- or 2+.
11310 $\frac{1}{2}^{\&}$ 20	(1-), 2+	2	(0.024)	S: 0.037 for $J\pi=2+$.
11453 $\frac{1}{2}^{\&}$ 25	(1-, 2+), 3-		(0.053)	$J\pi$: From L=2 or 3 (1993Gi04). S: (0.035) and 0.019 for $J\pi=(2+)$ and 3-, respectively (1993Gi04).
11644 $\frac{1}{2}^{\&}$ 20				
11831 $\frac{1}{2}^{\&}$ 20	(1-, 2+, 3-)		(0.20)	E(level): 1993Gi04 note as unresolved group at 11900 for four states. $J\pi$: From L=1,2,3 (1993Gi04). S: (0.11) and (0.05) for $J\pi=(2+)$ and (3-), respectively (1993Gi04).

[†] From 2007Ug01, except otherwise noted.[‡] From 1993Gi04.[§] Natural parity states are expected to populate in $^{22}\text{Ne}(^6\text{Li},d)$ reaction.[#] From measured deuteron angular distribution and DWBA calculations in 1993Gi04.[@] From 1993Gi04. For limiting space in spectroscopic field, only first value corresponding to first $J\pi$ assignment (if applicable) listed, additional value in comments section.[&] Three or more levels within uncertainty range in Adopted dataset – not referenced. **$^{23}\text{Na}(\alpha, p\gamma)$ 1986G106,1972Du05,1974Be08**

Others: 2015Ho09,2015To10,1984Bh03,1981Dy01,1974Na22,1974Be43.

1986G106: Targets were prepared from evaporation of NaBr onto a carbon foil and for lifetime measurements onto a gold foil; 14.2 and 16 MeV α beam; protons were detected with an annular ΔE -E telescope, consists of two surface-barrier Si detectors, placed at 180° with respect to beam direction; γ rays were detected by two Ge(Li) detectors placed at 0°, 30°, 45°, 55°, 60°, and 90° with respect to beam direction; Measured $E\gamma$, $I\gamma$, γ -ray angular distribution, $p\gamma$ coin, p - γ -ray angular correlation, mean lifetime for Doppler-shift attenuation method.

1972Du05: $^{23}\text{Na}(\alpha, p\gamma)$, $E=4.6$ -7.5 MeV; Ge(Li)-NaI(Tl) in anti-Compton and pair spectrometer mode; Measured $E\gamma$, $I\gamma$, deduced ^{26}Mg excited levels, mean lifetime using Doppler-shift attenuation method.

1974Be08: Target was prepared by evaporating NaCl onto Au foils; Projectile: α , $E=6.0$ -7.0 MeV. Ge(Li) detector at 0°. Measured mean lifetime using recoil distance method.

 ^{26}Mg Levels

E(level) [†]	$J\pi^{\dagger}$	$T_{1/2}^{\dagger}$	Comments
0.0			
1809 2		453 fs [§] 27	
2938 2		141 fs [§] 8	
3588 2		6.7 ps [‡] 8	
3941 2		0.96 ps [‡] 8	$T_{1/2}$: Other: 0.71 ps 9 (1981Dy01).
4318 2			
4332 2		20 fs [§] 3	
4350 2		125 fs [#] 38	
4835 1		26 fs 6	$T_{1/2}$: Other: 28 fs 6 (1981Dy01).
4901 1		24 fs 6	$T_{1/2}$: Other: 29 fs 6 (1981Dy01).
4972 2		527 fs [#] 166	
5292 1		16 fs 8	$T_{1/2}$: Others: <7 fs (1972Du05), <11 fs (1981Dy01).
5475 1		19 fs 6	$T_{1/2}$: Others: 24 fs 10 (1974Be08), <70 fs (1972Du05).

Continued on next page (footnotes at end of table)

$^{23}\text{Na}(\alpha, p\gamma)$ 1986G106, 1972Du05, 1974Be08 (continued) **^{26}Mg Levels (continued)**

E(level) [†]	J π [†]	T _{1/2} [†]	Comments
5692 1		≤ 8.3 fs	T _{1/2} : Other: <35 fs (1972Du05).
5715 1		87 fs $\frac{2}{3}$ 24	T _{1/2} : Other: 33 fs 16 (1986G106).
6125 1		14 fs 6	
6256 2			
6623 1	4+	19 fs 5	
6634 1	0 to 4	≤ 7 fs	
6745 1		16 fs 8	
6878			
6978 1	5+	14 fs 5	
7063 1		≤ 7 fs	
7100 1		≤ 14 fs	
7242 1		≤ 7 fs	
7262 1		≤ 7 fs	
7283 1	4-	24 fs 8	
7350 2			
7369 2			
7395 1	5+	≤ 14 fs	
7543 1		≤ 7 fs	
7677 1	3 to 5	≤ 11 fs	
7725 2			
7773 1		≤ 7 fs	
7817 2			
7822 2			
7840 2			
7953 1	5-	14 fs 6	
8036 2			
8050 2			
8184 2			
8202 1	6+	≤ 14 fs	
8233 2			
8248 2			
8456 2			
8464 2			
8472 1	6+	≤ 14 fs	
8508 2			
8531 2			
8625 1	3-, 4+, 5-	29 fs 6	
8670 1	3, 5	≤ 7 fs	
8705 2			
8860 2			
8902 2			
8930 2			
9020 2			
9043 2			
9065 1	5	≤ 7 fs	
9112 1	6+	≤ 11 fs	
9169 1	6-	26 fs 8	
9206 2			
9261 2			
9291 2			
9303 2			
9318 2			
9327 2			
9371 2			
9383 1	(4+, 6+)	≤ 7 fs	
9423 2			
9471 2			
9542 1	5	≤ 14 fs	
9574 2			
9590 2			
9681 2			
9771 2			
9814 2			

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$^{23}\text{Na}(\alpha, p\gamma)$ 1986G106, 1972Du05, 1974Be08 (continued) **^{26}Mg Levels (continued)**

E(level) [†]	$J\pi^{\dagger}$	$T_{1/2}^{\dagger}$	E(level) [†]	$T_{1/2}^{\dagger}$	E(level) [†]
9829 1	(5, 7) +	37 fs 10	10234 2		10943 2
9900 2			10350 2		11010 2
9927 2			10361 2		11191 2
9939 2			10377 2		11329 2
9966 2			10528 2		11457 2
9982 2			10576 2		11570 2
9989 1	6+	≤ 7 fs	10590 2		12088 2
10042 2			10650 1	21 fs 6	12196 2
10069 2			10695 2		12479 2
10122 2			10709 2		
10184 2			10766 2		

[†] From 1986G106, except otherwise noted.[‡] 1974Be08.[§] 1981Dy01.

1972Du05.

 $\gamma(^{26}\text{Mg})$

E(level)	$E_{\gamma}^{\ddagger}$	$I_{\gamma}^{\S}$	Mult.#	$\delta^{\@}$	Comments
1809	1809	100			
2938	1129	90 1			
	2938	10 1			
3588	1779	100			
3941	1003	67 3			
	2132	33 3			
4318	2509	100			
4332	1394	11 2			
	2523	85 4			
	4332	4 2			
4350	1412	51 4			
	2541	49 4			
4835	1897	91 2			
	3026	4 1			
	4835	5 1			
4901	960	4.0 5			
	1963	2.0 5			
	3092	94 1			
4972	2034	93 4			
	3163	7 4			
5292	1351	15 1			
	2354	73 3			
	3483	4 1			
	5291	4 1			
5475	1157	58 2			
	1534	29 2			
	3666	13 1			
5692	2754	29 4			
	3883	61 4			
	5691	10 2			
5715	1365	38 3			
	1774	38 3			
	2777	24 3			
6125	1775	87 2			
	2184	8 1			
	4316	5 1			
6256	564	7 4			
	4447	93 4			
6623	1148	9 1			
	1722	48 5	D+Q	-0.26 +60-10	$A_2=0.26$ 3; $A_4=-0.02$ 3 (1986G106).
	2273	21 3			

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$^{23}\text{Na}(\alpha, p\gamma)$ 1986G106, 1972Du05, 1974Be08 (continued) $\gamma(^{26}\text{Mg})$ (continued)

E(level)	$E_{\gamma}^{\pm}$	$I_{\gamma}^{\S}$	Mult.#	$\delta^{\oplus}$	Comments
6623	2291	11 2			
	2305	11 2			
6634	3696	94 1			
	4825	6 1			
6745	3807	40 4			
	4936	60 4			
6878	2937	20 3			
	3940	13 2			
	5069	67 4			
6978	1263	4 1			
	1503	50 4	D+Q	-0.21 5	$A_2=-0.54$ 3; $A_4=0.03$ 3 (1986G106).
	2077	11 2	D+Q	-1.0 6	$A_2=-0.82$ 8; $A_4=0.17$ 8 (1986G106).
	2628	4 1			
	2660	17 2	D+Q	-0.4 2	$A_2=-0.84$ 7; $A_4=0.22$ 6 (1986G106).
	3037	14 2			$A_2=0.24$ 7; $A_4=-0.15$ 8 (1986G106).
7063	3475	48 6			
	5253	52 6			
7100	2265	23 4			
	3159	32 5			
	4162	35 5			
	5290	10 3			
7242	2407	10 2			
	2892	22 4			
	2910	25 4			
	2924	19 4			
	3301	24 4			
7262	2912	6 1			
	3321	17 2			
	4324	31 5			
	5452	46 6			
7283	2965	40 5	D+Q	+0.5 4	$A_2=0.40$ 6; $A_4=-0.03$ 8 (1986G106).
	3342	60 6	D+Q	+0.03 7	$A_2=-0.28$ 5; $A_4=-0.00$ 6 (1986G106).
7350	4412	50 7			
	5540	27 5			
	7349	23 5			
7369	3019	14 2			
	3428	40 4			
	5559	13 2			
	7368 [†]	33			
7395	1680	50 4	D+Q	-0.14 2	$A_2=-0.52$ 3; $A_4=0.03$ 3 (1986G106).
	2494	18 2			
	3045	13 1			
	3077	7 2			
	3454	12 1			
7543	3211	47 5			
	3602	10 3			
	4605	33 5			
	5733	10 3			
7677	1552	17 2			
	1962	48 4			$A_2=0.38$ 4; $A_4=-0.08$ 5 (1986G106).
	2776	21 3			
	3359	14 2			
7725	3407	75 5			
	3784	25 5			
7773	2298	15 4			
	2938	15 4			
	3455	10 3			
	3832	5 7			
	4835	10 3			
7817	3485	100			
7822	3881	40 5			
	4884	40 5			
	6012	20 4			

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$^{23}\text{Na}(\alpha, p\gamma)$ 1986G106, 1972Du05, 1974Be08 (continued) $\gamma(^{26}\text{Mg})$ (continued)

E(level)	$E_{\gamma}^{\dagger}$	$I\gamma^{\S}$	Mult.#	$\delta^{\oplus}$	Comments
7840	3522	20 4			
	4252	43 5			
	4902	27 5			
	6030	10 3			
7953	2238	32 3			
	3635	68 3			
8036	5097	100			
8050	6240	100			
8184	5245	38 5			
	6374	62 5			
8202	1224	20 2	D(+Q)	-0.03 4	$A_2=-0.40$ 11; $A_4=0.01$ 8 (1986G106).
	3301	35 3			$A_2=0.42$ 4; $A_4=-0.18$ 5 (1986G106).
	3884	45 4			$A_2=0.42$ 3; $A_4=-0.23$ 4 (1986G106).
8233	6423	40 6			
	8232	60 6			
8248	5309	100			
8456	6646	100			
8464	4146	100			
8472	1494	24 3	D+Q	-0.32 10	$A_2=-0.63$ 10; $A_4=-0.01$ 8 (1986G106).
	3571	63 4			$A_2=0.39$ 2; $A_4=-0.26$ 6 (1986G106).
	4154	13 2			
8508	6698	60 6			
	8507	40 6			
8531	4181	85 3			
	5592	15 3			
8625	2002	85 3	D+Q	+0.03 1	$A_2=-0.13$ 3; $A_4=-0.10$ 4 (1986G106).
	4307	15 3	D(+Q)	-0.13 14	$A_2=-0.34$ 8; $A_4=-0.05$ 9 (1986G106).
8670	3195	35 5			$A_2=-0.14$ 4; $A_4=0.06$ 5 (1986G106).
	4352	65 5			$A_2=-0.53$ 5; $A_4=-0.02$ 5 (1986G106).
8705	3230	13 3			
	4387	45 5			
	4764	29 4			
	5766	13 3			
8860	4542 [†]	24 6			
	5921	31 6			
	7050	45 8			
8902	4552	30 5			
	4584 [†]	30 5			
	4960	40 7			
8930	2307	18 4			
	3215	36 5			
	3455	27 5			
	4988	19 4			
9020	4702	100			
9043	6104	100			
9065	1670	17 3	D+Q	+0.6 4	$A_2=0.64$ 11; $A_4=-0.31$ 15 (1986G106).
	4164	17 3			
	4747	66 5	D(+Q)	<0.00	$A_2=-0.19$ 6; $A_4=-0.12$ 7 (1986G106).
9112	1717	8 2			
	2489	8 2			
	3637	50 6			$A_2=0.45$ 4; $A_4=-0.20$ 4 (1986G106).
	4211	16 3			
	4794	18 3			
9169	1216	54 4	D+Q	-0.14 6	$A_2=-0.57$ 3; $A_4=-0.02$ 3 (1986G106).
	1774	21 3	D+Q	+0.07 5	$A_2=-0.10$ 3; $A_4=-0.12$ 4 (1986G106).
	1886	13 2			$A_2=0.14$ 5; $A_4=-0.25$ 8 (1986G106).
	2191	12 2			
9206	4888	100			
9261	5319	100			
9291	7481	100			
9303	4984	100			
9318	4985	100			
9327	5385	75 3			

Continued on next page (footnotes at end of table)

$^{23}\text{Na}(\alpha, p\gamma)$ 1986G106, 1972Du05, 1974Be08 (continued) $\gamma(^{26}\text{Mg})$ (continued)

E(level)	$E_{\gamma}^{\pm}$	$I_{\gamma}^{\S}$	Mult.#	$\delta^{\oplus}$	Comments
9327	6388	25 3			
9371	5429	100			
9383	1181	6 1			
	2405	29 4	D+Q	-0.14 6	$A_2=-0.55$ 4; $A_4=-0.01$ 4 (1986G106).
	2760	15 2	Q		$A_2=0.44$ 5; $A_4=-0.20$ 7 (1986G106).
	3668	39 5	Q		$A_2=0.42$ 4; $A_4=-0.14$ 5 (1986G106).
	5064	11 2			
9423	6484	60 6			
	7613	40 6			
9471	5529	100			
9542	2564	3.3 10	D(+Q)	+0.3 5	$A_2=1.10$ 29; $A_4=-0.39$ 27 (1986G106).
	3827	14 2			
	4641	21 4			
	5223	62 6	D+Q	+0.06 5	$A_2=-0.23$ 4; $A_4=0.07$ 5 (1986G106).
9574	3449	75 5			
	6635	25 5			E γ : Not reported in (n, γ) - 1992Wa06 - so not adopted.
9590	6651	60 8			
	7780	40 8			
9681	7871	100			
9771	4870	50 8			
	5452	50 8			
9814	5495	100			
9829	1357	6 1			
	1627	89 2			$A_2=-0.35$ 2; $A_4=-0.01$ 2 (1986G106).
	2434	5 1			
9900	6961	100			
9927	5025	100			
9939	5620	100			
9966	5064	60 5			
	7027	40 5			
9982	6040	100			
9989	1517	17 3	D+Q	-0.17 10	$A_2=0.32$ 7; $A_4=0.07$ 9 (1986G106).
	3011	69 5	D+Q	-0.09 5	$A_2=-0.44$ 5; $A_4=-0.04$ 6 (1986G106).
	5670	14 3			
10042	4327	45 6			
	5140	23 4			
	5723	32 4			
10069	5167	100			
10122	5803	100			E γ : Comparable 5800.69 γ reported in (n, γ) - 1992Wa06 from capture state.
10184	5282	100			
10234	5332	100			
10350	4875	50 9			E γ : Not reported in (n, γ) - 1992Wa06.
	5448	50 9			E γ : Not reported in (n, γ) - 1992Wa06.
10361	5459	50 9			E γ : Not reported in (n, γ) - 1992Wa06.
	6010	50 9			
10377	4662	100			
10528	4813	60 10			
	6195	40 10			
10576	2045	46 4			
	3598	54 4			
10590	1421	100			E γ : Not reported in (n, γ) - 1992Wa06.
10650	1481	36 5			
	2697	64 5			
10695	3300	100			
10709	4993	100			
10766	6415	69 6			
	7827	31 6			
10943	1560	10 2			
	1774	61 5			
	2318	29 4			
11010	6108	38 7			
	6691	62 7			

Continued on next page (footnotes at end of table)

$^{23}\text{Na}(\alpha, p\gamma)$ 1986G106, 1972Du05, 1974Be08 (continued) $\gamma(^{26}\text{Mg})$ (continued)

E(level)	$E\gamma^{\ddagger}$	$I\gamma^{\S}$	E(level)	$E\gamma^{\ddagger}$	$I\gamma^{\S}$	E(level)	$E\gamma^{\ddagger}$	$I\gamma^{\S}$
11191	3238	42 8	11570	3098	55 8	12196	3994	69 5
	5475	58 8		4175	45 8	12479	2650	61 6
11329	3934	64 5	12088	4693	44 8		4277	39 6
	4351	36 5		5109	56 8			
11457	6555	100	12196	3724	31 5			

$\dagger$ Uncertain placement in (n, γ) (1992Wa06) – not adopted.

$\ddagger$ From level energy differences, recoil energy subtracted.

$\S$ From 1986G106.

Assigned by evaluators, based on angular distribution coefficients.

@ From 1986G106.

 $^{24}\text{Mg}(t, p)$ 1986A106, 1965Hi05

Others: 1965Hi05, 1961Hi11.

1986A106: 99% enriched ^{24}Mg target (thickness 580 $\mu\text{g}/\text{cm}^2$); tritium beam, $E=18$ MeV; Protons were detected using a delay-line counter at focal plane of Enge spectrograph; FWHM about 40 keV; Measured proton spectra and angular distribution in 5° steps from 10° to 60° ; deduced excited levels of ^{26}Mg , L values.

1965Hi05: Target – Separated isotopes of ^{24}Mg on thin carbon backing; Projectile – 11.0 MeV triton; Measured proton spectrum at 27.5° and angular distribution of proton using a broad-range magnetic spectrograph; Deduced L value, $J\pi$.

 ^{26}Mg Levels

E(level) †	$J\pi^{\ddagger}$	$L^\dagger$	Comments
0 . 0	0+	0	
1805	2+	2	
2941	2+	2	
3584	0+	0	
3943			
4319			
4331			
4350	2+	2	
4830	2+	2	
4896			
4970	0+	0	
5287			
5472	4+	4	
5686			
5710			
6120	(2+)	(2)	
6253	0+	0	
6616			
6737	2+	2	
6870	3–	3	
6970			
7056	1–	1	
7068 10		(0)	E(level): Level reported in 1986A106 considered same as 7056 in 1965Hi05.
7342 10		3	
7410 10		(2)	
7525 10		4	L: Presumably erroneous.
7659			E(level): Unresolved doublet (1986A106).
7687 10			
7804 10		5	L: Presumably erroneous.
7958 10		5	
8045 10		2	
8240 10		1	
8627 10		5	
8866 10		2	

Continued on next page (footnotes at end of table)

$^{24}\text{Mg}(t,p)$ 1986Al06,1965Hi05 (continued) **^{26}Mg Levels (continued)**

E(level) [†]	L [†]	Comments
8934 10	0	L: Presumably erroneous.
9271 10	4	
9358 10	4	
9583 10	4	
9859 10	2	
9974 10	2	
10052 10	5	
10108 10	4	
10156 10	0	
10283 10	2	
10359		E(level): Unresolved doublet (1986Al06).
10421 10	4	
10518 10	(2)	

[†] Up to 7056 from 1965Hi05, above energies from 1986Al06.[‡] In 1965Hi05, based on L values. **$^{25}\text{Mg}(n,\gamma)$ E=thermal 1992Wa06**

Other references: 1991Ki04,1982Hu02,1980Is02,1969Se08,1967Sp05, 1987Gl06,2014MaZL.

Target $J\pi=5/2+$.1992Wa06: measured E_γ , I_γ with a Ge(Li)–NaI(Tl) in Compton–suppressed mode and pair spectrometer mode; deduced neutron separation energy $S(n)=11093.18$ keV 3.Other measured $S(n)=11093.10$ keV 9 (1990Pr02), 11091.91 keV 44 (1982Hu02), 11092.9 keV 5 (1980Is02).Evaluated $S(n)=11093.09$ keV 4 (2012Wa38).Measured thermal–neutron capture cross section $\sigma(n,\gamma)=200$ mb 3 (1992Wa06). **^{26}Mg Levels**

E(level) [†]	$J\pi^{\ddagger}$	$T_{1/2}^{\ddagger}$	Comments
0.0	0+	stable	
1808.74 4	2+	476 fs 21	
2938.33 4	2+	141 fs 8	
3588.56 9	0+	6.45 ps 48	
3941.55 4	3+	0.83 ps 12	
4318.88 6	4+	272 fs 16	
4332.57 5	2+	20 fs 3	
4350.08 4	3+	105 fs 28	
4835.13 5	2+	28 fs 6	
4901.30 9	4+	29 fs 6	
4972.30 5	0+	446 fs 70	
5291.74 5	2+	<10 fs	
5476.11 7	4+	21 fs 6	
5691.11 17	(1+)	<8 fs	
5715.60 10	4+	87 fs 24	
6125.48 4	3+	14 fs 6	
6634.31 15		≤7 fs	
6745.76 16	2+	16 fs 8	
6876.42 4	3–	83 fs 35	
7061.95 11	1–	≤7 fs	
7099.65 10	2+	≤14 fs	
7261.39 4		≤7 fs	
7282.74 5	(4–)	24 fs 8	
7348.87 5	3–		
7371.20 22	2+		
7541.73 5		≤7 fs	
7697.3 6			
7725.74 16	3+		
8052.9 6			

Continued on next page (footnotes at end of table)

$^{25}\text{Mg}(\text{n},\gamma)$ E=thermal 1992Wa06 (continued) **^{26}Mg Levels (continued)**

$E(\text{level})^\dagger$	$J\pi^\ddagger$	$T_{1/2}^\ddagger$	Comments
8184.96 10			
8227.56 16	1-	1.0 fs 2	
8250.73 10	(3+)		
8458.87 13			
8503.74 9			
8532.27 9			
8705.73 9			
8863.8 5			
8903.50 6			
8959.4 5			
9044.7 3			
9238.7 5	1(+)	314 as 40	
9325.51 6			
9427.74 7			
9574.02 6			
9617.0 9			
9856.52 6			
10102.41 15			
10126.69 11			
10220.1 3			
10350.37 13			
10362.42 7			
10599.95 7			
10681.9 3			
10718.75 9			
10745.98 13			
10805.9 4			
11093.18 4	2+, 3+		E(level): observed deexcitation intensity is 100% of g.s. feeding. E(level): S(n)=11093.09 4 (2012Wa38).

 † From least-squares fit to γ -ray energies. ‡ From Adopted Levels. **$\gamma(^{26}\text{Mg})$** I γ normalization: from 1992Wa06.

$E\gamma^\dagger$	$E(\text{level})$	$I\gamma^\ddagger@$	Mult.#	$\delta^\#$
287.5 4	11093.18	0.07 2		
347.20 12	11093.18	0.124 19		
374.43 8	11093.18	0.23 3		
391.0&	4332.57	<0.03		
409.4 ^a 5	4350.08	0.05 ^a 1		
	6125.48	0.05 ^a 1		
411.3 3	11093.18	0.070 10		
493.23 6	11093.18	0.74 9		
502.5 4	4835.13	0.20 4		
730.74 6	11093.18	1.59 6		
742.79 12	11093.18	0.22 4		
744.0&	4332.57	<0.05		
^x 767.86 22		0.18 3		
814.3&	5715.60	<0.03		
833.68 9	6125.48	0.48 6		
873.0 3	11093.18	0.08 2		
(959.5)	4901.30	0.12 [§] 3		
966.47 10	11093.18	0.39 4		
990.76 16	11093.18	0.30 3		
1003.25 4	3941.55	16.4 6		
1129.61 4	2938.33	92.0 3	M1+E2	-0.12 2
1157.23 6	5476.11	1.36 10	M1+E2	+0.09 7
1224.0 3	6125.48	0.18 3		
1236.64 5	11093.18	1.16 5		

Continued on next page (footnotes at end of table)

$^{25}\text{Mg}(\text{n},\gamma)$ E=thermal 1992Wa06 (continued) $\gamma(^{26}\text{Mg})$ (continued)

$E\gamma^\dagger$	E(level)	$I\gamma^\ddagger@$	Mult.#	$\delta^\#$
1290.40 7	6125.48	0.71 6		
1350.20 16	5291.74	0.16 3		
1358.4 9	5691.11	0.035 12		
1365.54 20	5715.60	0.63 8	M1+E2	-0.17 3
1394.28 7	4332.57	2.01 10		
1411.72 4	4350.08	13.4 5	M1+E2	-0.31 6
^x 1468.9 3		0.11 3		
1519.12 5	11093.18	2.62 10		
1534.49 15	5476.11	0.31 4	M1+E2	-0.27 4
1554.8 4	8903.50	0.13 2		
1567.06 11	7282.74	0.46 4		
1620.8 3	8903.50	0.35 4		
1642.09 25	8903.50	0.37 5		
1665.39 6	11093.18	1.22 7		
1767.61 4	11093.18	3.14 14		
1774.0 9	5715.60	0.79 12	M1+E2	-0.12 4
1775.31 5	6125.48	13.6 5		
1779.74 8	3588.56	1.30 6		
1792.87 12	6125.48	0.88 8		
1808.68 4	1808.74	186.0 6	E2	
1854.5 5	11093.18	0.24 5		
1873.1 5	7348.87	0.10 2		
1896.72 5	4835.13	9.6 5	M1(+E2)	-0.04 6
(1961.8)	4901.30	0.06 [§] 2		
2033.88 12	4972.30	0.59 7	E2	
2041.44 16	6876.42	0.47 6		
2048.2 3	11093.18	0.21 3		
^x 2064.2 5		0.10 3		
2132.71 4	3941.55	9.4 5		
2133.7 9	11093.18	0.32 5		
2183.83 6	6125.48	1.87 9		
2189.59 5	11093.18	6.16 20		
2264.25 21	7099.65	0.37 5		
2290.8 4	9574.02	0.23 4		
2353.27 5	5291.74	4.72 25		
2381.28 15	7282.74	0.51 5		
2387.33 8	11093.18	1.14 7		
^x 2410.8 3		0.14 3		
2426.09 6	7261.39	5.34 17		
2510.01 5	4318.88	6.0 3		
2513.52 8	7348.87	2.93 23		
2523.69 6	4332.57	10.4 5		
2541.18 6	4350.08	14.4 9	M1+E2	-0.10 4
2543.7 4	6876.42	0.61 8		
2557.2 3	6876.42	0.44 5		
2560.77 8	11093.18	1.60 8		
2589.30 8	11093.18	0.99 6		
2634.17 13	11093.18	0.82 6		
2697.7 3	9574.02	0.40 4		
2752.56 25	5691.11	0.24 4		
2776.82 20	5715.60	0.51 6		
2842.20 12	11093.18	2.35 13		
2865.27 21	11093.18	1.70 12		
2908.02 11	11093.18	2.80 15		
2911.12 19	7261.39	1.72 15		
2928.56 17	7261.39	2.01 15		
2932.5 4	7282.74	0.91 10		
2934.8 6	6876.42	0.42 9		
2938.15 5	2938.33	9.9 5	E2	
2942.3 ^{&}	7261.39	<0.20		
2963.61 9	7282.74	3.08 22	[E1]	
3016.18 23	7348.87	0.84 8		
3021.3 9	7371.20	0.10 3		

Continued on next page (footnotes at end of table)

$^{25}\text{Mg}(\text{n},\gamma)$ E=thermal 1992Wa06 (continued) $\gamma(^{26}\text{Mg})$ (continued)

$E_{\gamma}^{\dagger}$	E(level)	$I_{\gamma}^{\ddagger @}$	Mult.#	$\delta^{\#}$
3026.3 6	4835.13	0.46 6		
3029.6 8	7348.87	0.22 3		
3039.5 8	11093.18	1.27 4		
3092.31 11	4901.30	2.72 20	E2	
3158.4 6	7099.65	0.17 4		
(3163.1)	4972.30	0.05 § 3	E2	
3187.14 28	6125.48	0.78 8		
3191.2 6	7541.73	0.36 5		
3208.98 8	7541.73	4.13 19		
3261.8 4	10362.42	0.38 4		
3319.66 5	7261.39	10.1 4		
3341.01 7	7282.74	5.0 4	E1(+M2)	+0.03 7
3367.45 22	11093.18	0.87 6		
3395.3 7	11093.18	0.24 3		
3406.87 22	7725.74	1.02 9		
3428.7 4	7371.20	0.54 7		
3448.8 7	9574.02	0.34 4		
3472.9 3	7061.95	0.92 7		
3482.4 6	5291.74	0.31 4		
3500.6 9	10599.95	0.06 2		
3551.19 4	11093.18	11.2 4		
3599.86 14	7541.73	1.58 10		
3611.5 4	8903.50	0.49 5		
3667.1 9	5476.11	0.18 4		
3672.6&	7261.39	<0.20		
3695.63 25	6634.31	0.93 8		
3721.4 3	11093.18	0.77 6		
3744.01 4	11093.18	14.3 5		
3760.0&	7348.87	<0.20		
3783.8 9	7725.74	0.20 4		
3807.8 9	6745.76	0.33 6		
3810.13 5	11093.18	10.1 4		
3831.48 4	11093.18	43.6 14		
^x 3847.0 6		0.44 10		
3882.0 3	5691.11	0.60 7		
3937.80 11	6876.42	2.64 12		
3993.24 13	11093.18	1.76 9		
4001.8 3	8903.50	0.50 4		
4030.88 12	11093.18	1.82 9		
4122.9 6	7061.95	0.26 5		
4139.7 5	8458.87	0.28 4		
4160.96 20	7099.65	0.91 8		
4181.9 7	8532.27	0.23 4		
4216.38 4	11093.18	15.0 5		
4316.39 24	6125.48	0.66 7		
4322.68 8	7261.39	3.23 17		
4332.2 3	4332.57	0.79 8	E2	
4346.98 18	11093.18	0.67 5		
4355.3 6	8705.73	0.26 4		
4410.15 5	7348.87	7.0 4		
4424.2 8	9325.51	0.22 3		
4458.43 17	11093.18	0.94 6		
4489.4 9	9325.51	0.22 3		
4544.5&	8863.8	<0.03		
4553.02 13	8903.50	1.67 13		
4584.2&	8903.50	<0.06		
4602.93 7	7541.73	3.74 16		
(4825)	6634.31	0.06 § 1		
4834.61 18	4835.13	1.26 11	E2	
4886.3 5	10362.42	0.29 4		
^x 4891.9 4		0.20 4		
4936.3 3	6745.76	0.66 6		
4961.42 22	8903.50	1.57 12		

Continued on next page (footnotes at end of table)

$^{25}\text{Mg}(\text{n},\gamma)$ E=thermal 1992Wa06 (continued) $\gamma(^{26}\text{Mg})$ (continued)

$E\gamma^\dagger$	E(level)	$I\gamma^\ddagger@$	Mult.#	$E\gamma^\dagger$	E(level)	$I\gamma^\ddagger@$	Mult.#
4967.19 4	11093.18	17.0 6		6386.34 23	9325.51	0.82 6	
4975.3 9	9325.51	0.26 4		6417.9 3	8227.56	0.67 8	
4992.4 8	9325.51	0.39 5		6441.1 8	8250.73	0.069 14	
5020.7 8	9856.52	0.20 3		6488.6 4	9427.74	0.57 5	
5067.13 4	6876.42	10.1 4		6649.1 7	8458.87	0.51 3	
5077.4 9	9427.74	0.13 4		6657.3 5	10599.95	0.24 4	
5223.37 12	9574.02	1.64 14		6694.0 7	8503.74	0.22 3	
5245.9 3	8184.96	0.56 7		6722.1 7	8532.27	0.16 3	
5252.9 3	7061.95	0.55 6		6742.21 7	11093.18	4.21 16	
5290.3 5	7099.65	0.29 4		6759.73 11	11093.18	2.29 15	
5291.1 5	5291.74	0.18 3	E2	6773.1 3	11093.18	0.69 5	
5311.66 16	8250.73	1.77 11		7054.0 6	8863.8	0.16 2	
5376.1 8	11093.18	0.13 3		7060.6 7	7061.95	0.097 19	
5383.8 7	9325.51	0.13 3		7098.9 5	7099.65	0.10 3	
5401.3 4	11093.18	0.45 4		7150.61 7	11093.18	2.29 14	
5452.03 4	7261.39	21.3 7		7162.4 9	10102.41	0.08 2	
5523.6 7	9856.52	0.32 4		7187.4 8	10126.69	0.12 2	
5539.53 15	7348.87	2.22 14		7260.3&	7261.39	<0.03	
5562.9 9	7371.20	0.12 3		7347.7&	7348.87	<0.03	
5593.2 4	8532.27	0.35 4		7369.8 7	7371.20	0.18 3	
5616.8 3	11093.18	0.54 5		7617.8 7	9427.74	0.19 3	
5632.3 6	9574.02	0.24 3		7660.4 9	10599.95	0.11 2	
5691.1 9	5691.11	0.05 2	D	7695.6 8	7697.3	0.10 2	
5732.37 15	7541.73	1.72 13		7807.0 9	9617.0	0.10 2	
5766.6 3	8705.73	0.65 6		8153.54 5	11093.18	29.8 10	
5800.69 9	11093.18	3.15 12		8225.6 4	8227.56	0.43 4	
5915.8 9	9856.52	0.10 3		8316.4 8	10126.69	0.23 3	
5924.8 9	8863.8	0.11 2		8409.7 9	10220.1	0.11 2	
5964.31 20	8903.50	0.59 5		8502.2 3	8503.74	0.65 5	
^x 5975.3 7		0.08 2		8539.2 9	10350.37	0.10 2	
6011.2 5	10362.42	0.30 4		8552.2 3	10362.42	0.61 6	
6104.3 9	9044.7	0.13 3		8957.7 5	8959.4	0.32 3	
6120.11 4	11093.18	0.50 4		8996.5 9	10805.9	0.04 1	
6191.11 25	11093.18	0.53 4		9237.1 8	9238.7	0.41 2	M1
6242.9 7	8052.9	0.25 3		9282.68 6	11093.18	4.55 16	
6249.7 9	10599.95	0.09 2		9854.5 7	9856.52	0.14 3	
6257.1 3	11093.18	0.68 5		10100.5 4	10102.41	0.23 3	
6267.0 6	10599.95	0.28 4		11090.7 7	11093.18	0.28 4	
6375.38 16	8184.96	2.04 16					

† From 1992Wa06.

‡ In units of mb (1992Wa06).

§ Estimated by evaluators from branching ratio in Adopted Gammas.

From Adopted Gammas.

@ For intensity per 100 neutron captures, multiply by 0.50 2.

& Placement of transition in the level scheme is uncertain.

^a Multiply placed; undivided intensity given.^x γ ray not placed in level scheme.

$^{25}\text{Mg}(\text{n},\gamma),(\text{n},\text{n})$: Res 2012Ma14 $J\pi(^{25}\text{Mg})=5/2+$.

Target= ^{25}Mg of areal density 0.01234 atoms/b. Neutron beam at about 1 GeV produced in a massive lead target by a pulsed 20-GeV proton beam at CERN. Measured cross sections. Deduced spin and resonance parameters from R-matrix analysis.

 ^{26}Mg Levels

$E(\text{level})^{\dagger}$	$J\pi^{\S}$	Γ_{n}	L	Comments
10944.83? 4	2+	30.00 keV	0	$\Gamma_{\gamma}=6.5$ eV. $E(\text{n})(\text{lab})=-154.25$ keV.
11112.18 9	2+	2.31 keV 3	0	$\Gamma_{\gamma}=1.7$ eV 2. $E(\text{n})(\text{lab})=19.86$ 5.
11153.38 4	1+ [#]	28 eV 5	1	$\Gamma_{\gamma}=4.1$ eV 7. $E(\text{n})(\text{lab})=62.727$ 3.
11162.93 7	2+	5.08 keV 8	0	$\Gamma_{\gamma}=2.5$ eV 4. $E(\text{n})(\text{lab})=72.66$ 3.
11169.30 7	(3+)	1.56 keV 8	(0)	$\Gamma_{\gamma}=3.3$ eV 4. $E(\text{n})(\text{lab})=79.29$ 3.
11171.06 4	(2)+	0.8 eV 7	0	$\Gamma_{\gamma}=3$ eV 2. $E(\text{n})(\text{lab})=81.117$ 1.
11183.06 6	(1-)	0.6 eV 2	(1)	$\Gamma_{\gamma}=2.3$ eV 2. $E(\text{n})(\text{lab})=93.60$ 2.
11189.24 6	3+	5.24 keV 4	0	$\Gamma_{\gamma}=1.0$ eV 1. $E(\text{n})(\text{lab})=100.03$ 2.
11191.13 [†] 5	2- [†]	4 eV [†] 3	1 [†]	$\Gamma_{\gamma}=0.2$ eV 1. $E(\text{n})(\text{lab})=101.997$ 9.
11196.51 [†] 6	3+ [†]	2 eV [†] 1	0 [†]	$\Gamma_{\gamma}=0.3$ eV 1. $E(\text{n})(\text{lab})=107.60$ 2.
11243.36 6	(2-)	5.520 keV 20	(1)	$\Gamma_{\gamma}=6.1$ eV 4. $E(\text{n})(\text{lab})=156.34$ 2.
11274.13 5	(2)+	0.590 keV 20	0	$\Gamma_{\gamma}=1.7$ eV 2. $E(\text{n})(\text{lab})=188.347$ 9.
11280.03 5	4(-)	1.730 keV 20	(1)	$\Gamma_{\gamma}=0.2$ eV 1. $E(\text{n})(\text{lab})=194.482$ 9.
11285.52 7	1-	1.41 keV 6	1	$\Gamma_{\gamma}=0.3$ eV 3. $E(\text{n})(\text{lab})=200.20$ 3.
11286.24 5	(2+)	0.7 eV 7	(2)	$\Gamma_{\gamma}=3.0$ eV 3. $E(\text{n})(\text{lab})=200.944$ 6.
11289.06 4	(2-)	2 eV 1	(1)	$\Gamma_{\gamma}=0.8$ eV 3. $E(\text{n})(\text{lab})=203.878$ 1.
11293.28 [†] 5	1- [†]	0.230 eV [†] 20	1 [†]	$\Gamma_{\gamma}=1.2$ eV 5. $E(\text{n})(\text{lab})=208.27$ 1.
11296.04 9	(2-)	12.40 keV 10	(1)	$J\pi$: Spin assignment based on χ^2 . $\Gamma_{\gamma}=3.1$ eV 7. $E(\text{n})(\text{lab})=211.14$ 5.
11310.57 4	(1-)	0.4 eV 2	(1)	$\Gamma_{\gamma}=4$ eV 3. $E(\text{n})(\text{lab})=226.255$ 1.
11326.15 6	(1-)	0.3 eV 2	(1)	$\Gamma_{\gamma}=6$ eV 4. $E(\text{n})(\text{lab})=242.47$ 2.
11328.20 7	1-	50 eV 20	1	$\Gamma_{\gamma}=3.5$ eV 6. $E(\text{n})(\text{lab})=244.60$ 3.
11329.11 4	(1-)	0.5 eV 2	(1)	$\Gamma_{\gamma}=2.3$ eV 2. $E(\text{n})(\text{lab})=245.552$ 2.
11336.88 5	(1-)	0.1 eV 1	(1)	$\Gamma_{\gamma}=3.1$ eV 27. $E(\text{n})(\text{lab})=253.63$ 1.
11344.77 7	4(-)	3.49 keV 6	(1)	$\Gamma_{\gamma}=2.6$ eV 4. $E(\text{n})(\text{lab})=261.84$ 3.
11361.84 23	(2+)	3.29 keV 5	(0)	$\Gamma_{\gamma}=1.9$ eV 7. $E(\text{n})(\text{lab})=279.6$ 2.
11392.57 5	(5+)	240 eV [@] 10	(2)	$\Gamma_{\gamma}=(0.84)$ eV 9. $E(\text{n})(\text{lab})=311.57$ 1.
11441.08 6	4+	2.020 keV 40	2	$\Gamma_{\gamma}=2.2$ eV 2. $E(\text{n})(\text{lab})=362.04$ 2.
11465.62 8	(5-) [#]	8.91 keV [@] 8	(3)	$\Gamma_{\gamma}=(1.7)$ eV 3. $E(\text{n})(\text{lab})=387.57$ 4.

Continued on next page (footnotes at end of table)

$^{25}\text{Mg}(\text{n},\gamma),(\text{n},\text{n}): \text{Res} \quad 2012\text{Ma14 (continued)}$ **^{26}Mg Levels (continued)**

E(level) [†]	J π [§]	Γ_{n}	L	Comments
11500.09 5	(1-) [#]	25 eV@ 10	1	$\Gamma_{\gamma}=(20)$ eV 10. E(n)(lab)=423.43 1.
11526.82 10	(3-) [#]	3.00 keV@ 10	(1)	$\Gamma_{\gamma}=(6.6)$ eV 8. E(n)(lab)=451.24 6.
11587.99 7	(2-)	1.80 keV@ 10	(1)	$\Gamma_{\gamma}=(8.6)$ eV 8. E(n)(lab)=514.88 3.
11608.29 6	(4-)	0.84 keV@ 4	(1)	$\Gamma_{\gamma}=(2.7)$ eV 3. E(n)(lab)=536.00 2.

[†] 2012Ma14 note of caution for the resonance and associated parameters/values.

[‡] S(n)(^{26}Mg)+E(n)(c.m.), where S(n)=11093.09 keV 4 (2012Wa38).

[§] Assignment in 2012Ma14, based on R-matrix analysis, except otherwise noted.

[#] Listed in 2012Ma14 from literature.

@ Γ_{n} value should be considered with caution.

 $^{25}\text{Mg}(\text{d},\text{p}) \quad 1984\text{Ar16},1984\text{Bu13}$

J $\pi(^{25}\text{Mg})=5/2+$.

Other references: 1983Ch17,1980Ma32,1975To11,1966Lu06,.

1984Ar16: E=13 MeV; measured $\sigma(\text{Ep})$, $s(\theta)$. ^{26}Mg levels, deduced J, p, (2J+1)s. Magnetic spectrograph, gas ionization chamber. DWBA analysis, shell model calculations.

1984Bu13: E=12 MeV; measured $s(\theta)$, $s(\text{Ep})$. ^{26}Mg deduced levels, J, p, spectroscopic factors. DWBA analysis, shell model comparison.

 ^{26}Mg Levels

E(level) [†]	L [§]	S [§]	Comments
0.0	2	2.8	
1808 3	0+2	0.16, 3.5	
2937 3	0	3.4	
3586 3	2	0.32	
3938 3	0+2	2.0, 1.1	
4834 2	0+2	0.30, 1.1	
4896 3	2	1.5	
4965 6	(2) [#]	=0.03 [#]	
5289 2	2	3.3	
5472 3	2	2.2	
5711 3	2	0.56	
6121 3	0+2	0.74, 4.2	
6255 3			
6746 [‡] 1	0+2	0.04, 0.58	
6876 [‡] 1	1+3	1.2, 3.5	
7261 [‡] 1	1+3	1.5, 3.7	L,S: For doublet (7262+7283).
7283 [‡] 1			
7349 [‡] 1	1+3	1.1, 2.4	
7542 [‡] 1	1+3	0.36, 1.1	
7726 [‡] 1	2	0.80	
7773 [‡] 1	2	0.72	
7816 [‡] 2	0+2	0.62, 0.93	
7953 [‡] 1	3	7.8	

[†] From 1984Bu13, except otherwise noted.

[‡] From Adopted Levels, value rounded.

[§] From 1984Ar16, except otherwise noted.

[#] from 1984Bu13.

$^{25}\text{Mg}(\alpha, ^3\text{He})$ 1986Kr13, 1990Ya07 $J\pi(^{25}\text{Mg})=5/2+$.

1986Kr13: Self-supporting metallic 97.87% enriched ^{25}Mg target (thickness 0.44 mg/cm²); 80.9 MeV α beam; Reaction products were momentum analyzed using magnetic spectrograph; Position sensitive proportional counter, two gas proportional counters as ΔE , and a plastic scintillation counter as stopping E detector. Deduced excited levels of ^{26}Mg , spectroscopic factors, DWBA analysis.

1990Ya07: Self-supporting metallic 97.9% enriched ^{25}Mg target (thickness 80 $\mu\text{g}/\text{cm}^2$); 50 MeV α beam; Reaction products were momentum analyzed using magnetic spectrograph; Single wire proportional counter, ΔE and E counters; FWHM 25 MeV; Deduced excited levels of ^{26}Mg , spectroscopic factors.

 ^{26}Mg Levels

E(level) [†]	$J\pi^{\S}$	L&	S ^b	Comments
0.0	0+		0.76 $\frac{1}{2}$	
1809	2+		1.07 $\frac{1}{2}$	
2938	2+		1.0 $\frac{1}{2}$	
3589	0+		1.2 $\frac{1}{2}$	
3942	3+		1.16 $\frac{1}{2}$	
4319	4+		1.15 $\frac{1}{2}^c$	$J\pi$: 1990Ya07 list as 2+.
4333	2+		1.15 $\frac{1}{2}^c$	$J\pi$: 1990Ya07 list as 4+.
4350	3+		1.7 $\frac{1}{2}$	
4835	2+		2.0 $\frac{1}{2}$	
4901	4+		0.8 $\frac{1}{2}$	
4972	0+		0.92 $\frac{1}{2}$	
5290	2+		1.07 $\frac{1}{2}$	
5470	4+		0.75 $\frac{1}{2}$	
5691 $\frac{1}{2}$	1+ [#]		0.20	
5720	4+		0.68 $\frac{1}{2}$	
6125	3+ [#]		0.95 $\frac{1}{2}$	E(level): 6120 in 1990Ya07.
6256	0+		0.98 $\frac{1}{2}$	
6622	4+		5.5 $\frac{1}{2}$	
6745	2+		1.8 $\frac{1}{2}$	E(level): 6760 in 1990Ya07.
6877 $\frac{1}{2}$	3-		0.16, 0.99 $\frac{1}{2}$	S: Assuming f7/2 and p3/2 transfer, respectively (1990Ya07).
7062 $\frac{1}{2}$	1-		0.01, 0.07 $\frac{1}{2}$	S: Assuming f7/2 and p3/2 transfer, respectively (1990Ya07).
7100	2+		0.16 $\frac{1}{2}$	
7279 $\frac{1}{2}$	4-		0.40 $\frac{1}{2}$	
7347	@			
7676	@			
7697 $\frac{1}{2}$	1+ [#]		0.14	$J\pi$: 1(-) in Adopted Levels.
7775 $\frac{1}{2}$		3 ^a		
7827	@			
7953 $\frac{1}{2}$	5-		0.36 $\frac{1}{2}$	
8189 $\frac{1}{2}$		3 ^a		
8247	@			
8616	@			
8698 $\frac{1}{2}$		3 ^a		
8914 $\frac{1}{2}$		3 ^a		
9048	@			
9169 10		3	0.123, 0.13	S: Other: 0.18 (1990Ya07).
9256 $\frac{1}{2}$	1+		0.29	
9324 $\frac{1}{2}$		3 ^a		
9568 $\frac{1}{2}$	1+		0.57	
9716 $\frac{1}{2}$		3 ^a		
9774 $\frac{1}{2}$	1+		0.10	
10147 $\frac{1}{2}$	1+		0.26	
10340 $\frac{1}{2}$	1+		0.23	
10653 $\frac{1}{2}$	1+		0.57	
10697 $\frac{1}{2}$		3 ^a		
10931	@			
11169 $\frac{1}{2}$	1+		0.43	
11945 10		3	0.031, 0.02 9	
12512 10		3	0.063, 0.05 6	
12865 10		3	0.015, 0.01 3	
12958 10		3	0.006, 0.00 5	
13958 10		3	0.020, 0.01 7	
14542 10		3	0.014, 0.01 2	
16580 10			0.009, 0.00 9	

Footnotes continued on next page

$^{25}\text{Mg}(\alpha, ^3\text{He})$ 1986Kr13,1990Ya07 (continued) **^{26}Mg Levels (continued)**

[†] Up to 7100 from Adopted Levels (rounded to nearest keV), above level energies are from 1986Kr13, except otherwise noted.

[‡] From 1990Ya07.

[§] From Adopted Levels, except otherwise noted.

[#] Proposed in 1990Ya07 from cross section measurement and DWBA calculations.

[@] Natural parity – proposed in 1990Ya07 from cross section measurement and DWBA calculations.

[&] From 1986Kr13, except otherwise noted.

^a From 1990Ya07.

^b From 1986Kr13, except otherwise noted. First value with zero-range and second value with exact-finite-range calculations.

^c For doublet 4320 and 4330 levels (1990Ya07).

 $^{26}\text{Mg}(\text{pol } \gamma, \gamma'), (\gamma, \gamma')$ 2009Lo06,2009Sc06,1984Be26

Other references: 2010De29.

2009Lo06,2010De29: (pol γ, γ'): 99.41% enriched MgO target; E=10.8, 11.0, 11.2, 11.4 MeV γ -ray beam energies for nuclear resonance fluorescence at the TUNL H γ S facility. Four HPGe detectors for measurements of E γ , I γ and angular correlation with linear polarized beam. In 2010De29, total and partial widths are determined for five states which are relevant to predictions of neutron production for the s-process nucleosynthesis.

2009Sc07: (G,G'): 98.4% enriched MgO target; unpolarized photon from bremsstrahlung of E=13.0 MeV electrons, produced by ELBE accelerator at Dresden-Rossendorf research center, bombarded the target; scattered photons detected with four high-purity germanium detectors. Measured E γ , I γ , $\gamma(\theta)$, widths.

1984Be26: (pol γ, γ'): polarized photon from off-axis bremsstrahlung of E=18.0 MeV electrons on a 25 μm Al foil; Ge(Li) detectors placed at 0°, 90°, 180°, and 270° relative to polarization plane; Measured E γ , I γ , widths.

All data from 2009Lo06 unless otherwise stated.

 ^{26}Mg Levels

E(level) [†]	J π [†]	Γ [@]	Comments
0.0 [‡]	0+ [‡]		
1808.73 [‡] 3	2+ [‡]		
2938.34 [‡] 4	2+ [‡]		
3588.56 [‡] 9	0+ [‡]		
4332.57 [‡] 5	2+ [‡]		
4972.29 [‡] 12	0+ [‡]		
5291.74 [‡] 5	2+ [‡]		
7099.66 [‡] 10	2+ [‡]		
7697.3 [#] 8	1–		
8228.1 [#] 8	1(+)	1.0 fs ^{&} 2	$\Gamma_{\gamma 0}=0.23$ eV 5 (1984Be26). $\Gamma_0/\Gamma=51\%$ 4 (1984Be26).
8504.2 [#] 4	1–		
8959.9 [#] 7	1–		
9139.5 [#] 13	1		
9239.0 [#] 4	1+ [§]	314 as ^{&} 40	$\Gamma_{\gamma 0}=1.18$ eV 15 (1984Be26). $\Gamma_0/\Gamma=88\%$ 2 (1984Be26).
9563.5 [#] 8	1+ [§]	563 as ^{&} 99	$\Gamma_{\gamma 0}=0.51$ eV 9 (1984Be26). $\Gamma_0/\Gamma=71\%$ 5 (1984Be26).
9770.8 [#] 9	1(–)		
10103.1 [#] 7	1–		
10147.1 [#] 6	1+ [§]	112 as ^{&} 15	$\Gamma_{\gamma 0}=2.9$ eV 4 (1984Be26). $\Gamma_0/\Gamma=70\%$ 2 (1984Be26)v.
10319.5 [#] 7	1+ [§]	345 as ^{&} 83	$\Gamma_{\gamma 0}=0.79$ eV 19 (1984Be26). $\Gamma_0/\Gamma=100\%$ (1984Be26).
10573.3 8	1–	0.20 eV 5	Partial γ widths: 0.094 eV 26 for transition to g.s., 0.106 eV 29 for transition to 4972, 0+ level.
10647.3 8	1+ [§]	97 as 5	$\Gamma_{\gamma 0}=6.3$ eV 7 and $\Gamma_0/\Gamma=100\%$ (1984Be26). Γ : Deduced by evaluators using $\Gamma_0=4.12$ eV 20. Partial γ widths: 4.12 eV 20 for transition to g.s.; 0.07 eV 1 for transition to 1809, 2+; 0.30 eV 2 for transition to 2938, 2+; 0.08 eV 1 each for transitions to 4972, 0+ and 5292, 2+ levels; 0.06 eV 1 for transition to 7100, 2+ level.

Continued on next page (footnotes at end of table)

$^{26}\text{Mg}(\text{pol } \gamma, \gamma'), (\gamma, \gamma')$ 2009Lo06, 2009Sc06, 1984Be26 (continued) **^{26}Mg Levels (continued)**

E(level) [†]	$J\pi^{\ddagger}$	$\Gamma^{\textcircled{a}}$	Comments
10805.7 7	1−	0.72 eV 18	Partial γ widths: 0.16 eV 4 for transition to g.s., 0.56 eV 5 for transition to 1809, 2+ level.
10949.1 8	1−	1.87 eV 30	Partial γ widths: 0.26 eV 4 for transition to g.s.; 1.07 eV 5 for transition to 1809, 2+; 0.25 eV 2 for transition to 2938, 2+; 0.09 eV 1 for transition to 3589, 0+; and 0.20 eV 2 for transition to 4333, 2+ level.
11153.5 10	1+	11.2 eV 7	$\Gamma_{\gamma}=2.78$ eV 28. $J\pi$: Unnatural parity determined in 2009Lo06. Spin 1 in 2009Sc07. $\Gamma_{\gamma}/\Gamma=0.249$ adopted by 2010De29 from 2002Ko57. Partial γ widths: 1.91 eV 10 for transition to g.s.; 0.08 eV 4 for transition to 1809, 2+; 0.31 eV 3 for transition to 3589, 0+; 0.21 eV 2 for transition to 4333, 2+; and 0.27 5 for transition to 4972, 0+ level.

[†] From 2009Lo06, except otherwise noted. The assignments are from angular correlation and polarization measurements.

[‡] From Adopted Levels.

[§] From 1984Be26, based on polarization measurements.

[#] From 2009Sc07. Recoil and Doppler-shift-corrected energy.

[@] From 2010De29.

[&] Deduced by evaluators from Γ_0 (1984Be26) and γ_0 branching.

 $\gamma(^{26}\text{Mg})$

2010De29 note that multipolarity mixings were not determined, when transitions can be of a mixed nature.

$R=I\gamma(90^\circ)/I\gamma(127^\circ)$ (2009Sc07) listed as comments.

Γ_f =partial γ width to the final state (2009Sc07).

E(level)	$E\gamma^{\ddagger}$	$I\gamma^{\textcircled{a}}$	Comments
7697.3	4757.6 [‡]	24 [‡] 8	B(E1)= 15×10^{-6} 4 (2009Sc07). $\Gamma_f=0.16$ keV 4 (2009Sc07).
	5887.9 [‡]	11 [‡] 3	B(E1)= 3.6×10^{-6} 13 (2009Sc07). $\Gamma_f=0.076$ keV 26 (2009Sc07).
	7696.1 [‡]	65 [‡] 20	R=0.66 10 (2009Sc07). B(E1)= 9×10^{-6} 3 (2009Sc07). $\Gamma_f=0.45$ keV 15 (2009Sc07).
8228.1	6417.5 [‡]	49 [‡] 7	B(M1)= 8.9×10^{-2} 25 (2009Sc07). $\Gamma_f=0.28$ keV 8 (2009Sc07).
	8226.7 [‡]	51 [‡] 12	R=0.64 18 (2009Sc07). B(M1)= 4.4×10^{-2} 14 (2009Sc07). $\Gamma_f=0.29$ keV 9 (2009Sc07).
8504.2	6693.5 [‡]	29 [‡] 2	B(E1)= 28×10^{-6} 3 (2009Sc07). $\Gamma_f=0.88$ keV 10 (2009Sc07).
	8502.7 [‡]	71 [‡] 6	R=0.66 4 (2009Sc07). B(E1)= 33×10^{-6} 4 (2009Sc07). $\Gamma_f=2.14$ keV 27 (2009Sc07).
8959.9	7149.4 [‡]	39 [‡] 4	B(E1)= 16×10^{-6} 4 (2009Sc07). $\Gamma_f=0.60$ keV 14 (2009Sc07).
	8958.3 [‡]	61 [‡] 7	R=0.49 7 (2009Sc07). B(E1)= 12.5×10^{-6} 22 (2009Sc07). $\Gamma_f=0.94$ keV 16 (2009Sc07).
9139.5	9137.8 [‡]	100 [‡]	R=0.8 3 (2009Sc07). B(E1)= 1.7×10^{-6} 4 (2009Sc07). B(M1)= 1.4×10^{-2} 3 (2009Sc07). $\Gamma_f=0.13$ keV 3 (2009Sc07).
9239.0	5649.5 [‡]	19 [‡] 4	B(M1)= 17×10^{-2} 5 (2009Sc07). $\Gamma_f=0.35$ keV 10 (2009Sc07).
	9237.3 [‡]	81 [‡] 16	R=0.64 6 (2009Sc07). B(M1)= 16×10^{-2} 4 (2009Sc07). $\Gamma_f=1.47$ keV 33 (2009Sc07).
9563.5	7753.1 [‡]	33 [‡] 7	B(M1)= 5.4×10^{-2} 14 (2009Sc07). $\Gamma_f=0.30$ keV 8 (2009Sc07).
	9561.6 [‡]	67 [‡] 14	R=0.63 11 (2009Sc07). B(M1)= 5.8×10^{-2} 14 (2009Sc07). $\Gamma_f=0.59$ keV 15 (2009Sc07).

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$^{26}\text{Mg}(\text{pol } \gamma, \gamma'), (\gamma, \gamma')$ 2009Lo06, 2009Sc06, 1984Be26 (continued) $\gamma(^{26}\text{Mg})$ (continued)

E(level)	$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\S}$	Comments
9770.8	7961.1 $\ddagger$	41 $\ddagger$ 8	B(E1)= 7.2×10^{-6} 28 (2009Sc07). $\Gamma_f=0.38$ keV 15 (2009Sc07). R=0.53 11 (2009Sc07).
	9768.8 $\ddagger$	59 $\ddagger$ 11	B(E1)= 5.8×10^{-6} 14 (2009Sc07). $\Gamma_f=0.56$ keV 14 (2009Sc07).
10103.1	7162.9 $\ddagger$	21 $\ddagger$ 3	B(E1)= 14.3×10^{-6} 25 (2009Sc07). $\Gamma_f=0.55$ keV 10 (2009Sc07).
	10101.0 $\ddagger$	79 $\ddagger$ 11	R=0.74 7 (2009Sc07). B(E1)= 19×10^{-6} 3 (2009Sc07). $\Gamma_f=2.04$ keV 36 (2009Sc07).
10147.1	8337.9 $\ddagger$	30 $\ddagger$ 2	B(M1)= 21.1×10^{-2} 21 (2009Sc07). $\Gamma_f=1.44$ keV 14 (2009Sc07).
	10145.0 $\ddagger$	70 $\ddagger$ 6	R=0.61 8 (2009Sc07). B(M1)= 28×10^{-2} 4 (2009Sc07). $\Gamma_f=3.4$ keV 5 (2009Sc07).
10319.5	7378.4 $\ddagger$	40 $\ddagger$ 11	B(M1)= 10×10^{-2} 3 (2009Sc07). $\Gamma_f=0.48$ keV 15 (2009Sc07).
	10317.3 $\ddagger$	60 $\ddagger$ 13	R=0.70 14 (2009Sc07). B(M1)= 5.6×10^{-2} 15, 3.3×10^{-2} 5 if 100% branch for 10317 γ (2009Sc07). $\Gamma_f=0.72$ keV 19 (2009Sc07).
10573.3	5600.4	53 9	
	10571.0	47 10	B(E1)(W.u.)= 1.3×10^{-4} 4 (2010De29).
10647.3	3547.4	1.24 12	
	5355.0	1.62 13	
	5674.4	1.62 13	
	7707.7	6.4 3	
	8837.0	1.55 18	
	10645.0	88 3	B(M1)(W.u.)=0.16 8 (2010De29). E γ , I γ : Other: 10646.5 and 100 in 2009Sc07. R=0.75 5 (2009Sc07). B(M1)= 33×10^{-2} 3 (2009Sc07). $\Gamma_f=4.6$ keV 5 (2009Sc07).
10805.7	8995.3	78 9	
	10803.3	22 6	B(E1)(W.u.)= 2.1×10^{-4} 5 (2010De29).
10949.1	6615.6	10.8 10	I γ : uncertainty of 0.096 in table IV of 2009Lo06 seems to be a misprint; the evaluators have decreased it by a factor of 10.
	7359.4	4.7 7	
	8009.4	13.5 13	
	9138.7	57 3	
	10946.6	13.8 19	B(E1)(W.u.)= 3.3×10^{-4} 5 (2010De29).
11153.5	6180.4	9.6 24	
	6820.0	7.7 11	
	7563.8	11.0 22	
	9343.0	2.9 4	
	11150.9	69 8	E γ , I γ : Other: 11151.2 and 100 in 2009Sc07. B(M1)(W.u.)=0.0656 3 (2010De29). R=0.61 15 (2009Sc07). B(E1)= 1.7×10^{-6} 3 (2009Sc07). B(M1)= 1.6×10^{-2} 3 (2009Sc07). $\Gamma_f=0.25$ keV 5 (2009Sc07).

 $\dagger$ From level energy differences and recoil energy subtraction, except otherwise noted. $\ddagger$ From 2009Sc07. E γ values are mean of measured value at 90° and Doppler-shift corrected value measured at 127°. $\S$ Branching ratios from 2009Lo06. Listed values in 2009Lo06 are multiplied by 100.

$^{26}\text{Mg}(\gamma, n)$: Res 2014De13

Target: MgO (16.4185 g) with 99.41% 6 enrichment of ^{26}Mg . Projectile: Polarized γ -rays, E=10.80 to 12.05 MeV, from HI γ S-TUNL facility. The γ beam was produced by Compton back scattering of laser photons from 498–548 MeV electrons. Measured neutron energies by time-of-flight spectra (at $\theta_{\text{lab}}=90^\circ$) for a single liquid scintillator. Neutrons detected by nine liquid scintillator detectors. Gamma rays detected by an HPGe detector. Deduced neutron resonances and resonance strengths. R-matrix analysis.

 ^{26}Mg Levels

Statistical weight factor $g=(2J+1)/2$, where J is spin of the excited state.
 $S(n)(^{26}\text{Mg})=11093.09$ keV 4 (2012Wa38).

E(level)	$J\pi^\ddagger$	Comments
11150 8	1+	E(n)=55 keV. Resonance strength $g\Gamma_{\gamma 0}\Gamma_n/\Gamma=1.7$ eV 1(stat) 5(syst).
11289 [†] 25	1-	E(n)=188 keV. Resonance strength $g\Gamma_{\gamma 0}\Gamma_n/\Gamma=1.01$ eV 3(stat) 20(syst).
11329 [†] 31	(1-)	E(n)=227 keV. Resonance strength $g\Gamma_{\gamma 0}\Gamma_n/\Gamma=1.59$ eV 5(stat) 31(syst).
11506 [†] 55		E(n)=397 keV. Resonance strength $g\Gamma_{\gamma 0}\Gamma_n/\Gamma=5.70$ eV 15(stat) 110(syst).
11749 [†] 87		E(n)=637 keV. Resonance strength $g\Gamma_{\gamma 0}\Gamma_n/\Gamma=38.9$ eV 12(stat) 76(syst).

[†] Three or more levels within uncertainty range in Adopted data set – not referenced.

[‡] 2014De13 identify from comparison of data in 2012Ma14 (n, γ)(n,n).

 $^{26}\text{Mg}(e, e')$ 1974Le17,1995Se03

1974Le17: Target: 99.7% enriched self-supporting ^{26}Mg foil (thickness 46.8 mg/cm²); Electron beam, E=56.89,81.36,82.75,84.16,85.09,91.28, 95.74,110.45,110.71 MeV; Inelastic electron spectra were measured; Deduced ^{26}Mg excited level energies, form factors.
 1995Se03: 99.4% enriched ^{26}Mg target; Electron beam of energy 85 to 360 MeV; QDD spectrometer was used to collect data between 33° and 154°. Deduced excited level energy, spin and parity.

 ^{26}Mg Levels

E(level) [†]	$J\pi^\S$	L	Comments
0.0			
1809 5	2+	2	
2945 10	2+	2	
3579 11	0+	0	
3941 [‡] 5	3+ [‡]		
4337 25	2+	2	
4350 [‡] 5	3+ [‡]		
4875 15	4+	4	
4979 16	0+	0	
5294 19	2+	2	
5449 50	4+	4	
5720 22	4+	4	
6125 [‡] 5	3+ [‡]		
6216 20	0+	0	
6876 14	3-	3	
7082 16	2+	2	
7242 [‡] 5	3+ [‡]		
7364 15	2+	2	
7691 18	3-	3	J π : Poor form factor fitting for 3-.
7724 [‡] 5	3+ [‡]		
7830 17	3-	3	
8181 16	3-	3	
8220	(1-)	(1)	
8248 [‡] 5	3+ [‡]		
8456 [‡] 5	3+ [‡]		
8526 19	(2+)	(2)	

Continued on next page (footnotes at end of table)

$^{26}\text{Mg}(\text{e},\text{e}')$ 1974Le17,1995Se03 (continued) **^{26}Mg Levels (continued)**

$E(\text{level})^\dagger$	$J\pi^\S$	L	$E(\text{level})^\dagger$	$J\pi^\S$	L	$E(\text{level})^\dagger$	$J\pi^\S$	L
8892 14	2+	2	9800	(1-)	(1)	10650 [#] 50	1-	1
9042 [‡] 5	3+ [‡]		9860 18	2+	2	10680 [#] 34	4+	4
9250	(1-)	(1)	9902 [‡] 5	3+ [‡]		10838 24	2+	2
9287 19	2+	2	10199 27	1-	1	10990 27	2+	2
9423 [‡] 5	3+ [‡]		10330 [#] 20	(3-)	(3)			
9727 25			10491 23	2+	2			

[†] From 1974Le17, except otherwise noted.

[‡] From 1995Se08. Uncertainty for excited levels are ≤ 5 keV noted in 1995Se03, evaluators list as 5 keV. Spin and parity assignments are based on form factors, γ decay and shell model calculations.

[§] From 1974Le17, based on relations of experimental form factors and reduced transition probability for transition of multipolarity L, except otherwise noted.

[#] Level energy overlaps with more than three excited level energies in Adopted Levels and not referenced.

 $^{26}\text{Mg}(\text{p},\text{p}'),(\text{p},\text{p}'\gamma)$ 1976Mo27,1968Ha18,1989Se01

Other references: 1963Br15,1968FeZY,1970Br21,1970De01,1974Na22,
1977Ki02,1979Al06,1980Fa07,1980Ka22,1980Va10,1981Al16,1981Pl07,
1982Be32,1982Bl01,1983Mi25,1983Zw02,1985Sc04,1986Ro09,1988Bl08, 1989Cr02,2007Ta27,2009Ta13.

1976Mo27: $^{26}\text{Mg}(\text{p},\text{p}')$ – 99% enriched ^{26}Mg evaporated onto a 30 ± 5 $\mu\text{g}/\text{cm}^2$ carbon foil; 20000 keV 15 proton beam; scattered protons detected by a 1 m single wire helical cathode proportional chamber; deduced excited level energies.

1968Ha18: $^{26}\text{Mg}(\text{p},\text{p}'\gamma)$ – Enriched (>99%) self-supporting ^{26}Mg target (thickness 5 mg/cm^2 or 1 mg/cm^2); 3.8 – 8.3 MeV proton beam; Ge(Li) and NaI detectors in suppressed mode and pair production mode; Measured γ -ray branching ratio, deduced mean lifetime of excited states by Doppler-shift attenuation method.

1989Se01: $^{26}\text{Mg}(\text{Pol p},\text{p}')$ – Enriched (98.8%) ^{26}Mg target (thickness 8.45 mg/cm^2); polarized proton beam, $E=134$ MeV; scatter protons were analyzed by magnetic spectrometer; Data were taken every 5° from 10° to 60° ; FWHM about 80 keV; Measured differential cross sections, Deduced excited level energies, $J\pi$.

1988Bl08: 26mm(pol p,p), (pol p,p'), $E=800$ MeV; measured $\sigma(\theta)$, analyzing power vs θ . Deduced excited levels and L.

 ^{26}Mg Levels

$E(\text{level})^\dagger$	$J\pi$	$T_{1/2}^\S$	L^a	Comments
0.0				
1808.70 6			2	
2938.38 10	2@		2	
3588.8 6	0@			
3940.8 5	3@			
4318.4 5	4@			
4332.2 3	(2)@		2+4	
4350.0 2	3@	62 fs 28		
4834.3 4	2@			
4900.3 4	(3,4)@		4	
4972.0 10	0@	374 fs 173		
5290.8 4	(2)@	<35 fs	2	
5473.7 10			4	
5689.8 10		49 fs 35	4	L: For doublet (1988Bl08).
5715.5 4			4	L: For doublet (1988Bl08).
6127 3				
6256 1		42 fs 35		E(level): From Adopted Levels.
6621 3				
6745 3		55 fs 28	2	
6878 3		69 fs 42	3	
6977 3				
7061 3				
7099 3				
7200 20	(0,1)+			E(level), $J\pi$: From 1989Cr02.

Continued on next page (footnotes at end of table)

$^{26}\text{Mg}(\text{p},\text{p}'),(\text{p},\text{p}'\gamma)$ 1976Mo27,1968Ha18,1989Se01 (continued) ^{26}Mg Levels (continued)

$E(\text{level})^\dagger$	$J\pi$	L^a	Comments
7246 3			
7261 3			
7282 3			
7350 3			
7372 3			
7397 3			
7428 3	$(0, 1) +$		$J\pi$: From 1989Cr02.
7543 3			
7674 3		(3)	L: For doublet (1988B108).
7694 3		(3)	L: For doublet (1988B108).
7723 3			
7771 3			
7815 3			
7828 3		3	
7851 3			
7950 3	$5 - \#$		
8031 3		6	
8051 3			
8183 3			
8198 3			
8225 3		3^b	
8249 3			
8399 3			
8456 3			
8470 3			
8501 3			
8530 3			
8576 3			
8622 3	$5 - \#$		
8668 3			
8702 3		4	
8861 3			
8901 3			
8929 3			
8957 3			
9040 3			
9059 3			
9110 3			
9167 3	$6 - \#$		
9238 3	$1 + \&$		
9262 3			
9281 3			
9307 3			
9313 3			
9322 3			
9377 3			
9425 3			
9471 3			
9537 3			
9558 3			
9569 3			
9579 3			
9618 3			
9681 3			
9714 3			
9767 3			
9779 3			
9823 3			
9852 3			
9883 3			
9905 3			
9940 3			
9968 3			

Continued on next page (footnotes at end of table)

$^{26}\text{Mg}(\text{p,p}'), (\text{p,p}'\gamma)$ 1976Mo27, 1968Ha18, 1989Se01 (continued) **^{26}Mg Levels (continued)**

$E(\text{level})^\dagger$	$J\pi$	L^a	$E(\text{level})^\dagger$	$J\pi$	$E(\text{level})^\dagger$	$J\pi$
9985 3			10516 3		10950 3	
10037 3			10530 3		10978 3	
10099 3			10567 3		10998 3	
10124 3			10595 3		11017 3	
10136 3			10644 3	$1_+^\&$	11048 3	
10148 3	$1_+^\&$		10678 3		11084 3	
10159 3			10689 3		11114 3	
10213 3			10702 3		11156 3	$1_+^\&$
10271 3			10715 3		11171 3	
10316 3			10726 3		11980 ‡ 30	(6-) $^\#$
10328 3			10744 3		12490 ‡ 30	(6-) $^\#$
10341 3			10769 3		12850 ‡ 30	(6-) $^\#$
10353 3			10824 3		14500 ‡ 50	(6-) $^\#$
10365 3			10881 3		16500 ‡ 50	(6-) $^\#$
10414 3		4	10893 3		18050 ‡ 50	(6-) $^\#$
10487 3			10915 3			
10493 3			10927 3			

† From Adopted Levels for <6127 keV. Above level energies are from 1976Mo27, except otherwise noted.

‡ From 1989Se01.

§ From 1968Ha18 using the Doppler-shift attenuation method.

$^\#$ From 1989Se01 (pol p,p'), based on measured angular distributions and analyzing power.

@ From 1970Br21 – (p,p' γ) and (p,p' $\gamma\gamma$) – based on angular correlation measurements.

$^\&$ From 1989Cr02, based on (p,p') angular distribution measurements.

a From 1988Bl08.

b For triplet (1988Bl08), probably erroneous.

 $^{26}\text{Mg}(\alpha,\alpha'\gamma), ^{22}\text{Ne}(\alpha,n)$ 1975Na06, 1975Wa10, 1991Ha06

Other references:

1994Da09, 1983Ch17, 1982Yu01, 1981Va09, 1980Va10, 1975Na06, 1974Na22, 1969Ca18 – $^{22}\text{Ne}(\alpha,\alpha), (\alpha,\alpha')$.

1979Ku13 – $^{22}\text{Ne}(\alpha,\gamma)$.

1989Wo09 – $^{22}\text{Ne}(\alpha,\gamma), (\alpha,n\gamma)$ – considered to be superseded by 1991Ha06.

1993Gi04, 1993Dr08, 1991Dr01 – $^{22}\text{Ne}(\alpha,n)$.

1975Na06: $^{26}\text{Mg}(\alpha,\alpha'\gamma)$, E=17.1 MeV; Measured E_γ , γ -ray branching, $\alpha\gamma$ coin, $\gamma\gamma(\theta)$.

1975Wa10: $^{26}\text{Mg}(\alpha,\alpha'\gamma)$, E=16 MeV; measured E_g , I_g , mean lifetime by Doppler-shift attenuation method. Ge(Li) detectors.

1991Ha06: $^{26}\text{Mg}(\alpha,n)$, E=0.7–2.1 MeV; Measured spectroscopic factors.

 ^{26}Mg Levels

$E(\text{level})^\dagger$	$J\pi$	$T_{1/2}^\&$	$\omega\gamma^a$	Comments
0.0				
1808.74 ‡ 4	$^\#$			
2938.33 ‡ 4	$^\#$			
3588.56 ‡ 9	$^\#$			
4318.89 ‡ 4	$^\#$			
4332.52 ‡ 5	$^\#$			
4350.08 ‡ 4		111 fs 38		
4901.44 ‡ 7	4_+			$J\pi$: From 1969Ca18 – $\alpha\gamma$ angular correlation.
4972.30 ‡ 5		444 fs 69		
5291.74 ‡ 6	$^\#$	69 fs 42		
5476.05 ‡ 7	$^\#$	<49 fs		
5691.08 ‡ 19	@			
5715.91 ‡ 8	$^\#$	159 fs 69		
6125 2				
6256 2		62 fs 31		
6621 2	$^\#$	<69 fs		
6743 2	$^\#$	<35 fs		

Continued on next page (footnotes at end of table)

$^{26}\text{Mg}(\alpha, \alpha'\gamma), ^{22}\text{Ne}(\alpha, n)$ 1975Na06, 1975Wa10, 1991Ha06 (continued) **^{26}Mg Levels (continued)**

E(level) [†]	J π	T _{1/2} ^{&}	$\omega\gamma^a$	Comments
6871 6		104 fs 52		
6979 3				
7062 4				
7099 4				
7349 4				
7364 4				
7394 4				
7815 7				
8181 3				
8201 2	#			
8470 5	#			
8624 3				
8700 3	#			
9055 8				
9109 3	#			
11142? § 6				E _R (Lab)=(623 keV 6) (1991Dr01). The existence of this resonance is considered doubtful by 1991Ha06.
11317 § 3		<3 keV	8.2×10 ⁻⁵	E _R (Lab)=830 keV 3 (1991Ha06) – Separate yields are given for n ₀ , n ₁ , and n ₂ groups. Also $\omega\gamma=2.4\times 10^{-4}$ eV 8 (1993Gi04).
11451 § 5		<3 keV	2.5×10 ⁻⁴ 7	E _R (Lab)=988 keV 5 (1991Ha06).
11517 § 5		<3 keV	0.0016 4	E _R (Lab)=1066 keV 5 (1991Ha06).
11611 § 5		<3 keV	0.0049 12	E _R (Lab)=1178 keV 5 (1991Ha06).
11646 § 5		<3 keV	0.0048 12	E _R (Lab)=1219 keV 5 (1991Ha06).
11795 § 10		<3 keV	0.015 4	E _R (Lab)=1395 keV 10 (1991Ha06).
11827 § 2		<3 keV	0.61 9	E _R (Lab)=1433 keV 2 (1991Ha06) – Separate yields are given for n ₀ , n ₁ , and n ₂ groups.
11890 § 2		<3 keV	0.30 6	E _R (Lab)=1507 keV 2 (1991Ha06) – Separate yields are given for n ₀ , n ₁ , and n ₂ groups.
11909 § 2		6 keV 1	1.5 3	E _R (Lab)=1530 keV 2 (1991Ha06) – Separate yields are given for n ₀ , n ₁ , and n ₂ groups.
11950 § 2		3 keV 1	1.3 2	E _R (Lab)=1578 keV 2 (1991Ha06) – Separate yields are given for n ₀ , n ₁ , and n ₂ groups.
12049 § 2		6 keV 2	6.3 10	E _R (Lab)=1695 keV 2 (1991Ha06) – Separate yields are given for n ₀ , n ₁ , and n ₂ groups.
12110 § 2		25 keV 5	1.0 2	E _R (Lab)=1767 keV 2 (1991Ha06).
12141 § 2		15 keV 2	2.7 4	E _R (Lab)=1804 keV 2 (1991Ha06).
12345 § 2		40 keV 2	165 25	E _R (Lab)=2045 keV 2 (1991Ha06).

[†] From 1975Na06, except otherwise noted.[‡] From Adopted Levels.[§] Deduced using resonance energy E_R, listed in comments, and Q(α)=10614.8 1 (2012Wa38).

Natural parity (1975Na06).

@ Possible unnatural parity (1975Na06).

& From 1975Wa10.

^a Resonance strength in units of eV (1991Ha06). **$^{27}\text{Al}(\mu^-, \nu n\gamma)$ 2007Me18**

The μ^- beam obtained from decay of π^- beam at 90 MeV/c. Measured γ -ray yields using two HPGe detectors at TRIUMF facility.

Muonic Lyman (or K) series for Aluminum

μ x-ray	Energy	Intensity (in% per capture)
2p-1s	346.828 a)	79.8 8
3p-1s	412.87 5	7.62 15
4p-1s	435.96 10	4.87 10
5p-1s	446.61 10	3.86 10
6p-1s	452.38 10	2.20 10

Continued on next page (footnotes at end of table)

$^{27}\text{Al}(\mu^-, \nu\gamma)$ 2007Me18 (continued)(7 to ∞)p-1s

1.63 15

a) 346.828 x-ray energy was used for calibration

 ^{26}Mg Levels

E(level) [†]	$J\pi^{\dagger}$	Percent direct yield/muon capture	Comments
0.0	0+	4	Percent direct yield/muon capture: estimated from (γ ,p) reaction.
			Known cascading=53% 5.
1808.73 8	2+	19 6	Known cascading=32% 2.
2938.34 8	2+	5.7 2	Known cascading=9.8% 6.
3588.56 13	0+	0.65 20	
3941.55 10	3+	2.8 3	Known cascading=0.77% 26.
4318.88 11	4+	8.2 7	Known cascading=0.46% 15.
4332.57 10	2+	3.50 10	Known cascading=0.04% 2.
4350.08 10	3+	4.4 7	
4835.13 13	2+	3.06 20	
4901.30 13	4+	1.38 30	
4972.29 13	0+	0.43 10	
5291.74 13	2+	1.36 28	
5476.11 10	4+	0.8 3	
5691.11 10	(1+)	1.0 6	
7824 3	3-	1.2 6	
8052.9	2(+)	<0.45	
8705.73		<1.0	
9044.7	3(+)	<0.3	

[†] From Adopted Levels. **$\gamma(^{26}\text{Mg})$**

$E\gamma^{\dagger}$	E(level)	$I\gamma^{\ddagger\S}$	$E\gamma^{\dagger}$	E(level)	$I\gamma^{\ddagger\S}$	$E\gamma^{\dagger}$	E(level)	$I\gamma^{\ddagger\S}$
1003.25 4	3941.55	2.3 2	2033.88 12	4972.29	0.4 1	3667.4 5	5476.11	0.2 2
1129.61 4	2938.34	14.8 15	2132.71 4	3941.55	1.3 2	3882.0 3	5691.11	0.50 25
1157.23 6	5476.11	0.40 14	2353.27 5	5291.74	1.2 2	3882	7824	0.50 25
1394.28 7	4332.57	0.5 2	2510.01 5	4318.88	8.7 7	4355.3 6	8705.73	<0.6
1411.72 4	4350.08	2.3 4	2523.69 6	4332.57	2.8 8	4763	8705.73	<0.22
1534.49 15	5476.11	0.3 3	2541.18 6	4350.08	1.7 5	4885	7824	0.45 15
1779.74 8	3588.56	0.65 20	2752.56 25	5691.11	0.5 5	6104.3 [#] 9	9044.7	<0.3
1808.68 4	1808.73	51 5	2938.15 5	2938.34	1.1 2	6242.9 7	8052.9	<0.45
1896.72 5	4835.13	2.6 2	3092.31 11	4901.30	1.3 3			

[†] From Adopted Gammas.[‡] Percent yield per muon capture.[§] Absolute intensity per 100 incident particles.[#] Placement of transition in the level scheme is uncertain. **$^{27}\text{Al}(\text{d}, ^3\text{He})$ 1993Ve03** $J\pi(^{27}\text{Al})=5/2+$.

Other references: 1977Ro17, 1971Ar08, 1969Wa01, 1968Wi20.

Self-supporting ^{27}Al target (thickness 39 ± 3 $\mu\text{g}/\text{cm}^2$); 29 MeV deuteron beam; Enge split-pole magnetic spectrograph; ^3He spectrum taken at 10° (lab), angular distribution was measured from 5° to 41° in steps of 4° , FWHM=16 keV,

DWBA analysis; Deduce excited level energy, L value, and spectroscopic factors.

 ^{26}Mg Levels

E(level) [#]	$J\pi^{\dagger}$	L	S	Comments
0.0	0+	2	0.45	
1808.74 4	2+	0+2	0.009, 1.5	

Continued on next page (footnotes at end of table)

$^{27}\text{Al}(\text{d}, ^3\text{He})$ 1993Ve03 (continued) ^{26}Mg Levels (continued)

E(level) [#]	$J\pi^\dagger$	L	S	Comments
2938.34 4	2+	0+2	0.023, 0.33	
3588.56 9	0+	2	0.009	
3941.55 4	3+	0+2	0.008, 0.03	
4318.88 6	4+	(0+2)		
4332.57 5	2+	(0+2)		
4350.08 5	3+	0+2	0.09, 0.18	
4835.13 5	2+	0+2	0.14, 0.12	
4901.30 9	4+	2	(0.024)	
4972.29 12	0+	2	0.003	
5291.74 5	2+	0+2	0.024, 0.017	
5476.11 7	4+	2	0.032	
5691.11 17	$1+\frac{7}{2}$	2	0.045	
5715.60 10	4+	2	0.11	
6124 5	3+	0+2	0.039, 0.11	
6626 5	(0 to 4)+ $\frac{7}{2}$	(2)	0.044	
6744 5	2+	0+2	0.002, 0.020	
6874 5	3-	1	0.065	
6976 5	(5+)	2	0.057	
7059 5	1-			
7099 5	2+	2	0.09	
7247 5	(2, 3)+ $\frac{7}{2}$	0+2	0.035, 0.14	
7282 5	(4-)			
7350 5	3-			
7372 5	2+	2	0.077	
7397 5	(5+)	2	0.13	
7543 5				
7677 5	(3, 4)+ $\frac{7}{2}$	2	0.10	
7697 5	$1-\frac{7}{2}$	1	0.14	
7724 5	3+	2	0.072	
7771 5		2	(0.04)	
7828 5		1	1.2	E(level): Doublet.
7954 5	5-			
8030 5				
8053 5	(1 to 4)- $\frac{7}{2}\S$	1	0.11\S	
8188 5				
8204 5	(6+)			
8228 5				
8253 5				
8458 5	(0 to 5)+ $\frac{7}{2}$	2	0.044	
8474 5	(6+)			
8503 5				
8530 5				
8579 5				
8626 5	5-			
8668 5	(3, 5)			
8702 5	(2 to 4)+ $\frac{7}{2}$	2	0.18	
8860 5	2+	2	(0.03)	
8899 5	(1 to 4)- $\frac{7}{2}\S$	1	0.048\S	
8930 5	4+			
8956 5				
9043 5	(1 to 4)- $\frac{7}{2}\S$	1	0.75\S	$J\pi$: 3(+) in Adopted Levels.
9060 5	$5+\frac{7}{2}$			
9113 5				
9174 5				
9241 5	(1 to 4)-\S	1	0.17\S	
9381 5				
9427 5				
9473 5	(0 to 5)+ $\frac{7}{2}$	2	0.13	
9541 5				
9574 5				
9576 5				
9622 5	(1 to 4)- $\frac{7}{2}\S$	1	0.17\S	
9683 5	(1 to 5)+ $\frac{7}{2}$	2	0.068	

Footnotes continued on next page

$^{27}\text{Al}(\text{d},^3\text{He})$ 1993Ve03 (continued) **^{26}Mg Levels (continued)**

† From Adopted Levels, except otherwise noted.

‡ Proposed by 1993Ve03.

§ Assignment from L=1. Spectroscopic factors deduced assuming a $1p_{1/2}$ transfer.# From Adopted Levels for $E < 6100$. **$^{27}\text{Al}(\text{t},\alpha)$ 1961Hi11**

Triton beam, $E=5.95$ MeV; Magnetic Spectrometer, α -particle energy spectra measured at 30° , 40° , and 50° laboratory angle. Deduced excited level energy. Also $^{25}\text{Mg}(\text{d},\text{p})^{26}\text{Mg}$ and $^{24}\text{Mg}(\text{t},\text{p})^{26}\text{Mg}$.

 ^{26}Mg Levels

<u>E(level)[†]</u>	<u>E(level)[†]</u>	<u>E(level)[†]</u>
0.0	7400	9294
1800	7531	9366
2938	7670	9415 15
3571	7716	9461 15
3944	7762	9528 15
4316	7816	9564 15
4834	7948	9615 15
4900	8030	9674 15
4976	8189	9707 15
5290	8233	9760 15
5471	8384	9814 15
5684	8448	9841 15
5709	8488	9895 15
6120	8518	9931 15
6259	8566	9970 15
6617	8611	10028 15
6740	8660	10090 15
6871	8694	10118 15
6971	8849	10213 15
7058	8889	10272 15
7092	8917	10316 15
7241	9031	10358 15
7252	9101	10400 15
7338	9157	10419 15
7352	9225	10483 15
7377	9242	10515 15

† Uncertainty for level energies below 9415 keV is not mentioned for this reaction in 1961Hi11. 1961Hi11 note uncertainty for weighted average with data measured in other reactions by 1961Hi11. Based on noted uncertainty for higher excited energies – probably an uncertainty of 15 keV would be a good estimate.

 $^{28}\text{Si}(\mu^-, \text{vpn}\gamma)$ 2007Me18

The μ^- beam obtained from decay of π^- beam at 90 MeV/c. Measured γ -ray yields using two HPGe detectors at TRIUMF facility.

Muonic Lyman (or K) series for Silicon

μ x-ray	Energy	Intensity (in% per capture)
2p-1s	400.177 a)	80.3 8
3p-1s	476.80 5	7.40 20
4p-1s	503.58 10	4.27 20
5p-1s	515.97 10	3.83 20
6p-1s	522.74 10	2.29 10
(7p to ∞ p)-1s		1.87 20

Continued on next page (footnotes at end of table)

$^{28}\text{Si}(\mu^-, \nu p n \gamma)$ 2007Me18 (continued)

a): 400.177-keV x ray used for calibration

 ^{26}Mg Levels

E(level) [†]	J π [†]
0.0	0+
1808.73	2+
2938.34	2+
3588.56	0+
3941.55	3+
4318.88	4+
4332.57	2+

[†] From Adopted Levels.

 $\gamma(^{26}\text{Mg})$

E γ [†]	E(level)	I γ [‡]	Comments
1003.25 4	3941.55	0.25 5	
1129.61 4	2938.34	2.11 14	
1779.74 8	3588.56	<2.0	I γ : masked by 1778.97 γ from ^{28}Si , mostly from ^{28}Al decay.
1808.68 4	1808.73	7.9 8	
2132.71 4	3941.55	0.14 7	
2510.01 5	4318.88	0.49 24	
2523.69 6	4332.57	<0.13	
2938.15 5	2938.34	0.52 23	

[†] From Adopted Gammas.

[‡] Percent yield per muon capture.

[§] Absolute intensity per 100 incident particles.

Adopted Levels, Gammas

$Q(\beta^-) = -5069.14$ 8; $S(n) = 11365.3$ 5; $S(p) = 6306.31$ 5; $Q(\alpha) = -9453.51$ 18 2012Wa38.

Other reactions:

$\text{Cu}(p, X)$, $E = 120$ GeV: 2015Se13.

$^{12}\text{C}(^{16}\text{O}, d)$: 1980Al29, 1973Br08.

$^{14}\text{N}(^{16}\text{O}, \alpha)$: 1982Ta02.

$^{24}\text{Mg}(^6\text{Li}, \alpha)$: 1969Da19.

$^{27}\text{Al}(d, t)$: 1980Me01.

$^{26}\text{Al}(^6\text{Li}, ^6\text{He})$: 1999Ue03.

$^{28}\text{Si}(p, X)$, $E = 1.1$ GeV: Measured 418.2 keV I and 831.4 keV γ -rays (2004Va04).

 ^{26}Al Levels

Cross Reference (XREF) Flags

A ^{26}Si β^+ Decay
B ^{27}P β^+p Decay
C $^{23}\text{Na}(\alpha, n\gamma)$
D $^{24}\text{Mg}(^3\text{He}, p\gamma)$
E $^{24}\text{Mg}(\alpha, d)$
F $^{25}\text{Mg}(p, \gamma), (p, p)$

G $^{25}\text{Mg}(^3\text{He}, d), (d, n)$
H $^{25}\text{Mg}(\alpha, t)$
I $^{25}\text{Mg}(^{11}\text{B}, ^{10}\text{Be})$
J $^{26}\text{Mg}(p, n), (p, n\gamma)$
K $^{26}\text{Mg}(^3\text{He}, t)$
L $^{27}\text{Al}(p, d), (^3\text{He}, \alpha)$

M $^{27}\text{Al}(d, t)$
N $^{28}\text{Si}(\mu^-, \nu 2n\gamma)$
O Others:
 $^{28}\text{Si}(p, ^3\text{He})$
 $^{28}\text{Si}(d, \alpha), (\text{pol } d, \alpha)$

$E(\text{level})^\dagger$	$J\pi$	XREF	$T_{1/2}^b$	Comments
0.0	5+	ABCDEFGHIJKLMNO	7.17×10^5 y 24	$\% \epsilon + \% \beta^+ = 100$; $T = 0$. $\mu = +2.804$ 4; $Q = +0.27$ 3. $J\pi$: From Cross-section and vector analyzing-power angular distribution for the (pol d, α) (1978Ik01); $L = 4$ in (α, d) and (d, α), unnatural parity (pol d, α). Also from (p, n) (1988Le17). $T_{1/2}$: Weighted average of $7.16\text{E}5$ y 32 (1972Sa02), $7.05\text{E}5$ y 24 (1983NoZZ), $7.02\text{E}5$ y 56 (1983MiZZ) and $7.80\text{E}5$ y 50 (1983Th04). Uncertainty is the lowest input value. μ : From 1996Co04, 2014StZZ. Q : From 1997Le19, 2014StZZ. $\% \epsilon + \% \beta^+ = 100$; $T = 1$. $J\pi$: $L = 0$ in ($^3\text{He}, p$) and (p, n). $T_{1/2}$: Weighted average of 6.346 s 5 (1969Fr08), 6.351 s 10 (1972Ha82), 6.346 s 5 (1975Az01), 6.3395 s 45 (1977Al11), 6.3462 s 26 (1983Ko22), 6.34654 s 76 (2011Fi01), 6.345 s 14 (2005Sc01), 6.3478 s 25 (2011Sc22), and 6.3453 s 9 (2013Ch51). Uncertainty from lowest input value. $\mu = +2.0$ 5; $T = 0$. μ : From 1989Ra17. $J\pi$: $L = 2$ in (α, d) and (d, α), unnatural parity (pol d, α); γ to 5+. $T_{1/2}$: From mean lifetime of 1.73 ns 2: weighted average of mean lifetime 1.77 ns 7 (1961Go31), 1.86 ns 9 (1963Ga07), 1.85 ns 10 (1964Be34), and 1.72 ns 2 (1976Ak01). $T = 0$. $J\pi$: $L = 0$ in (p, n); $L = 0 + 2$ in (d, α); unnatural parity in (pol d, α). $T_{1/2}$: From mean lifetime 36 fs 7: weighted average of 40 fs 10 (1973Go10) and 31 fs 1 (1967Yo05). $T = 0$. $J\pi$: $L = 2$ in ($^3\text{He}, p$) and (d, α); natural parity (pol d, α). $T_{1/2}$: From mean lifetime 5.5 ps 8: weighted average of 3.3 ps 9 (1972Du05), 2.4 ps 7 (1973Go10), 5.7 ps 11 (1972Ma67), 6.4 ps 4 (1974Be08), and 6.3 ps 5 (1974Be43). (1974Be43),..
228.305 13	0+	AB DEFGHIJKLMNO	6.3460 s 8	
416.852 3	3+	A D FGHIJKLMNO	1.20 ns 1	
1057.739 12	1+	A CD FGHIJKLMNO	25 fs 5	
1759.034 8	2+	A CD FGHIJ LMNO	3.8 ps 6	

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Adopted Levels, Gammas (continued) ^{26}Al Levels (continued)

E(level) [†]	J π	XREF	T _{1/2} ^b	Comments
1850.62 3	1+	A D FGH JKLMNO	32 fs 3	T=0. J π : L=0 in (α ,d) and (p,n); unnatural parity in (pol d, α). T _{1/2} : From mean lifetime 46 fs 4: weighted average of 47 fs 5 (1983Ke05), 40 fs 10 (1974De37), 43 fs 11 (1973Go10), 100 fs 60 (1968Ha18). Other: 16 fs 7 (1968Ha42).
2068.86 5	(4+) [@]	CD Fg J lmNo	310 fs 50	T=0. T _{1/2} : From mean lifetime of 450 fs 70: weighted average of 500 fs 130 (1974De37), 525 fs 170 (1973Go10), 380 fs 110 (1972Du05), 380 fs 130 (1968Ha42), 400 fs 350 (1968Ha18).
2069.47 3	(2+) [@]	D FgH J lmNo	14 fs 2	T=1. T _{1/2} : From mean lifetime of 20 fs 3: weighted average of 22 fs 3 (1982Ke08) 19 fs 6 (1974De37), 30 fs 15 (1973Go10), 13 fs 5 (1968Ha42). Other: <400 fs (1968Ha18).
2071.64 4	1+ [@]	A CD Fg JKlmNo	367 fs 69	T=0. T _{1/2} : From mean lifetime of 530 fs 100: weighted average of 730 fs 100 (1983Ke05), 530 fs 200 (1974De37), 390 fs 50 (1973Go10), 460 fs 120 (1972Du05), 560 fs 280 (1968Ha42), 460 fs 130 (1968Ha18), and 1000 fs 100 (1972Be08).
2365.150 18	3+	CD FGH J LM O	0.8 ps 2	T=0. J π : L=4 in (d, α); Unnatural parity in (pol d, α); γ to 1+. T _{1/2} : From mean lifetime of 1.2 ps 3: weighted average of 0.95 ps 24 (1973Go10), 2.00 ps 55 (1972Du05), 1.4 fs 5 (1968Ha18).
2545.367 17	3+	CD FGH JKLM O	0.69 ps 17	T=0. J π : L=2 in (^3He ,p); Unnatural parity in (pol d, α); γ to 1+. T _{1/2} : From mean lifetime of 1.00 ps 25: weighted average of 0.90 ps 40 (1974De37), 0.86 ps 40 (1973Go10), 1.25 ps 40 (1972Du05).
2660.92 5	2+	D FGH J L O	3 ps 3	T=0. J π : L=2 in (d, α); Natural parity in (pol d, α). T _{1/2} : From 1973Go10.
2740.03 3	1+	A F H JKL O	31 fs 3	T=0. J π : L=2 in (d, α); L=0 in (p,n); Unnatural parity in (pol d, α). T _{1/2} : From mean lifetime of 45 fs 5: weighted average of 41 fs 7 (1983Ke05), 38 fs 13 (1974De37), 54 fs 8 (1973Go10).
2913.40 5	2+	CD FGH JKL O	68 fs 4	T=0. J π : L=2 in (^3He ,p) and in (d, α); Natural parity in (pol d, α). T _{1/2} : From mean lifetime of 98 fs 6: weighted average of 101 fs 7 (1983Ke05), 91 fs 18 (1974De37), 85 fs 15 (1973Go10).
3073.63 4	3+	FGH J L O	194 fs 31	T=0. J π : L=4 in (α ,d) and in (^3He ,p); Unnatural parity in (pol d, α); γ to 1+. T _{1/2} : From mean lifetime of 280 fs 45: weighted average of 310 fs 40 (1983Ke05), 150 fs 60 (1974De37), 290 fs 70 (1973Go10).
3159.889 13	2+	D FGH JKLM O	3.5 fs 7	T=1. J π : L=2 in (^3He ,p); Natural parity in (pol d, α). T _{1/2} : From mean lifetime of 5 fs 1: weighted average of 9 fs 2 (1982Ke08), 8 fs 3 (1983Ke05), 3.6 fs 10 (1973Go10), 4.9 fs 12 (1982De15). Other: <15 fs (1974De37).

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Adopted Levels, Gammas (continued) ^{26}Al Levels (continued)

E(level) [†]	J π	XREF	T _{1/2} ^b	Comments
3402.65 6	5+	CD F H J LM O	67 fs 12	T=0. J π : L=4 in (d, α); unnatural parity in (pol d, α); (M1+E2) to 5+. Also angular distribution measurements in (p,n) and calculations. T _{1/2} : From mean lifetime 96 fs 18: weighted average of 110 fs 15 (1983Ke05) and 74 fs 19 (1971Sh19).
3507.63 8	6+	C F H J LM O	17 fs 3	T=0. J π : L=6 in (d, α); Natural parity in (pol d, α). T _{1/2} : From mean lifetime 24 fs 5: Weighted average of 26 fs 8 (1983Ke05) and 23 fs 6 (1973Br08). Other mean lifetime: <30 fs (1971Sh19).
3596.34 4	3+	D FGH KL O	18 fs 3	T=0. J π : L=2 in (d, α) and (^3He ,p); Unnatural parity in (pol d, α); γ to 5+.
3674.92 5	4+	F J L	155 fs 20	T _{1/2} : From mean lifetime 26 fs 4: Weighted average of 24 fs 6 (1983Ke05) 30 fs 13 (1974De37), 44 fs 7 (1973Go10). T=0. J π : Natural parity in (pol d, α); γ to 5+, 2+.
3680.68 6	3+	D FGH L O	8.3 fs 14	T _{1/2} : From mean lifetime 225 fs 30: Weighted average of 220 fs 30 (1983Ke05) and 260 fs 70 (1974De37). T=0. J π : L=2 in (d, α); unnatural parity in (pol d, α); γ to 5+.
3723.81 4	1+	A D F JKL O	4.2 fs 14	T _{1/2} : From 1983Ke05. Other values: 19 fs 8 (1973Go10), <18 fs (1974De37). T=0. J π : L=0 in (d, α) and (^3He ,p); Unnatural parity in (pol d, α).
3750.90 4	2+	D FGH L O	22 fs 6	T _{1/2} : From 1983Ke05. Other values: <16 fs (1973Go10), <18 fs (1974De37). T=0. J π : L=2 in (d, α) and natural parity in (pol d, α) for doublet.
3753.63 13	0+	D F O	5 fs 2	T _{1/2} : From mean lifetime of 32 fs 8: weighted average of 37 fs 16 (1983Ke05), 21 fs 8 (1974De37), and 43 fs 9 (1973Go10). T=1. J π : L=0 in (^3He ,p); Natural parity in (pol d, α) for doublet.
3921.96 24	7+, (5+)	C F H L	19 fs 4	T _{1/2} : From 1983Ke05. Other values: 19 fs 8 (1973Go10), 22 fs 11 (1974De37). T=0. J π : From 1974Pr08 – (α ,n γ), based on γ -ray angular distribution coefficients and polarization measurements.
3962.83 5	(3+)	H	37 fs 5	T _{1/2} : From 1973Br08 (^{16}O ,d). T=0. J π : L=(2) in (^3He ,p); Unnatural parity in (pol d, α); γ to 5+.
3977.91 9	0–	D F L O	>1.0 ps ^c	T _{1/2} : From mean lifetime of 54 fs 7: weighted average of mean lifetime 54 fs 11 (1983Ke05), 41 fs 13 (1974De37), and 68 fs 14 (1973Go10). T=0. J π : From (pol d, α).
4191.92 6	(3+)	D FgH L	5 fs ^d 2	T=1. J π : Unnatural parity in (pol d, α); γ to 5+, 2+.
4205.86 5	(4+)	D Fg L	62 fs ^d 10	T=0. J π : Natural parity in (pol d, α); γ to 5+, 3+, 2+.
4349.34 7	3+	D F H L	9 fs ^d 3	T=0. J π : L=2 in (^3He ,p); Unnatural parity in (pol d, α); γ to 5+.
				T _{1/2} : Other: <10 fs (1974De37).

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Adopted Levels, Gammas (continued) ^{26}Al Levels (continued)

E(level) [†]	J π	XREF	T _{1/2} ^b	Comments
4430.72 6	2-	D F H KLM O	59 fs ^c 13	T=0. XREF: M(4443). J π : L=1 in (d, α); Unnatural parity. L=4 in (^3He ,p) probably erroneous.
4480.48 9	0-	EF H	62 fs 12	T=0. J π : From (pol d, α) (1986Bo02, 1986Da09). T _{1/2} : From mean lifetime 90 fs 17: Weighted average of 80 fs 20 (1983Ke05) 110 fs 30 (1974De37).
4547.92 6	2+	F H L	<11 fs	T=1. J π : From 1980Ni10, based on γ decay, feedings, and strengths.
4599.17 5	(3+)	FG KL	5 fs ^d 2	T _{1/2} : From 1974De37. T=1. J π : Unnatural parity in (pol d, α); 3 from γ decay; γ feeding from 4-.
4622.38 5	(2-)	F	53 fs ^d 18	T=0. J π : Unnatural parity in (pol d, α); (1+ to 3+) from γ decay but discarded from γ feeding.
4705.37 4	(4+)	FGH LM O	<3 fs ^d	T=1. XREF: M(4719). J π : Possible natural parity in (pol d, α); (3+,4) from γ decay and (3+,4-) discarded from γ feeding.
4773.35 6	4+	FGH L O	82 fs ^d 12	T _{1/2} : Other: <11 fs (1974De37). T=0. J π : L=4 in (d, α); Natural parity in (pol d, α).
4939.64 9	(1-)	F L	69 fs 14	T=0. J π : Unnatural parity for doublet in (pol d, α); from γ -decay J π =(1,2+), T=1 or J=1, T=0; Discarded 1+ from γ -feeding.
4940.79 5	(5+)	F	24 fs ^c 6	T _{1/2} : From mean lifetime 100 fs 20: weighted average of 93 fs 27 (1983Ke05), 110 fs 30 (1974De37). T=0. J π : Unnatural parity for doublet in (pol d, α); from γ -decay J π =(4,5+); Discarded 4+ from γ -feeding.
4952.30 4	(3+)	F H L o	10 fs ^d 3	T=0. J π : L=2+4 in (d, α); Unnatural parity in (pol d, α); (2,3+) from γ -decay; Discarded 2 from γ -feeding.
5006.66 16	(2-)&	F L o	120 fs ^c 30	T=0. J π : Unnatural parity in (pol d, α).
5010.24 7	(1+)&	F H KL	<6 fs ^c	T=0. J π : L=0 in (^3He ,t).
5131.93 5	(4+)&	F	<3 fs ^c	T=1. J π : Natural parity in (pol d, α) for doublet.
5141.68 6	(2+)&	FGH L	<4 fs ^c	T=1. J π : Natural parity in (pol d, α) for doublet.
5195.11 12	(0+)&	F L O	<24 fs ^c	T=1.
5245.28 4	(4+)&	FGH L	12 fs ^d 3	T=0. J π : Natural parity in (pol d, α).
5395.53 7	(4-)&	FG L	65 fs ^d 50	T=0. J π : Unnatural parity in (pol d, α).
5431.23 10	(1-)&	F	12 fs ^c 6	T=0. J π : Possible natural parity in (pol d, α).
5456.71 5	(3-)&	Fg	17 fs ^c 4	T=0.
5461.87 13	0+, (1,2)&	Fg	<20 fs ^c	T=0.
5487.93 6	5+, (4-)&	Fg l	17 fs ^c 6	T=0.
5494.51 5	(2+)&	Fg l	<5 fs ^c	T=0.
5513.48 4	(4+)&	FG L	35 fs ^d 4	T=0. J π : Natural parity in (pol d, α).
5544.56 7	(2+)&	FGH L	15 fs ^d 13	T=1.
5569.16 19	(4,5)&	F		T=0.
5584.99 6	(1)&	FG K	<6 fs	T=0.
5598.30 6	(2,3)-&	F L O	19 fs ^c 7	T=0.
5671.04 7	1+&	FG	<30 fs ^c	T=0.

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Adopted Levels, Gammas (continued) ^{26}Al Levels (continued)

E(level) [†]	J π	XREF	T _{1/2} ^b	Comments
5676.07 5	(4-)&	Fg	22 fs ^d 10	T=0.
5692.15 5	(3-)&	Fg L O	2.8 fs ^d 11	T=0.
5726.38 5	(4+)&	F H L	<5 fs ^c	T=1. J π : Possible natural parity in (pol d, α).
5849.21 8	(2+)&	F H L	10 fs ^c 6	T=0. J π : Possible natural parity in (pol d, α).
5882.65 9	(3+)&	F H	<12 fs ^c	T=0. J π : Unnatural parity in (pol d, α).
5916.10 6	(2-)&	Fg	<2 fs ^d	T=0.
5924.19 7	(4+)&	Fg	<12 fs ^c	T=1.
5949.93 8	1(+)&	F K O	<30 fs ^c	T=0. J π : L=0 in (³ He,t), but possible natural parity in (pol d, α).
6028.02 4	(1+)&	F	<4 fs ^c	T=1. J π : Analogue state of ²⁶ Mg at 5690 keV (J π =1).
6084.07 5	(5-) [‡]	EFg	90 fs ^c 20	T=0.
6086.47 11	(1-, 2+)&	Fg	14 fs ^c 11	T=0.
6120.01 7	(4 to 6)+&	F	10 fs ^c 3	T=0. J π : 6+ in 1996Br06 (p, γ) based on γ -ray feeding.
6197.56 19	(1, 2+)&	F	c	T=0.
6238.4 3	(1)&	F	<7 fs ^c	T=0.
6254.06 20	(3-)	F		T=0. J π : From γ feeding.
6270.19 11	1+&	Fg K	<9 fs ^c	T=0. J π : L=0 in (³ He,t).
6280.33 9	(3+)&	Fg	<14 fs ^c	T=0.
6343.46 8	(3-)&	FG	<6 fs ^c	T=0.
6363.99 8	(3+)&	FG	22 fs ^c 11	T=1.
6398.64 21	(1+, 2)	FG		T=0. J π : From γ -ray feeding. In 1990En08 J π =2-, quoted L=1 from (p,p0).
6414.46 10	(0 to 2+)&	D FG o		T=1. J π : In 1990En08 (earlier evaluation) J π =0+ based on L=0 in (p,n) - (1987Ma19) - however the L value could not be found in 1987Ma19.
6436.44 11	(3 to 5+)	D FG	<17 fs ^c	T=0.
6495.94 7	(3 to 5+)	FG o	<8 fs ^c	T=0. J π : 5 in 1996Br06.
6550.68 7	(4+, 5-)&	FG		T=0. J π : 5- in 1998En04. Parity determined from a comparison of Γ_p from (p, γ) and (³ He,d) (1996Il01).
6598.32 16	(5+)&	F		T=0.
6610.40 6	(3-)&	FG		T=0.
6680.45 7	(2+)&	FG K	1.2 eV 3	T=0.
6695 1	(7)	F		T=0. J π : From 1996Br06 - $\sigma_T(\theta)$.
6724.25 7	(4-)&	FG		T=0.
6783.79 5	(2-)&	F		T=0.
6789.30 4	(3-)&	FG		T=0.
6801.12 4	(3+)&	F	0.34 eV 6	T=0.
6801.60 16	1+, (1-, 2-)&	F	0.34 eV 6	T=0+1.
6815.74 10	6+, (4, 5)&	Fg	<15 fs	T=0.
6817.86 9	(4+)&	Fg o	0.7 eV 3	T=1.
6851.50 11	(2+)&	F o		T=1+0.
6874.29 8	1+&	F K	0.43 eV 23	T=0. J π : L=0 in (³ He,t).
6875.73 6	(2+)&	F		T=1.
6891.70 4	(6-)	EF GH J L		T=0. XREF: E(6880). J π : From angular distribution measurements and DWIA calculations (1988Le17 - (p,n)).
6936.20 8	(1+)&	F		T=0.
6964.48 9	(3-)&	FGH		T=1.

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Adopted Levels, Gammas (continued) ^{26}Al Levels (continued)

E(level) [†]	J π	XREF	T _{1/2} ^b	Comments
7000.91 9	(2+)&	F		T=0.
7015.01 11	(5+)&	F	0.18 eV 5	T=0.
7051.22 7	(3+)&	F	0.95 eV 11	T=0.
7085.97 16	1-	F		T=1.
				J π : Analogue state of ^{26}Mg at 7060 keV (J π =1-).
7092.78 9	(2+)&	F	0.68 eV 12	T=0.
7108.71 8	(4)-&	F H	75 eV 20	T=0.
				J π : L=1 in (p,p).
7141.80 5	(2)-	F J	200 eV 50	T=0(+1).
				J π : L=1 in (p,p).
7152.84 6	(3)+&	F	90 eV 25	T=0.
				J π : L=0 in (p,p).
7160.97 9	(3)-&	F o	90 eV 25	T=0.
				J π : L=1 in (p,p).
7167.65 6	(4)-&	FGH o	80 eV 20	T=0.
				J π : L=1 in (p,p).
7198.44 12	1+&	F K		T=0.
				J π : L=in (^3He ,t).
7222.42 9	(5+)&	F		T=1.
				J π : 4+ excluded for γ -ray feeding from 6- state at 7529.26 keV.
7237.68 5	(3)-&	F	100 eV 25	T=0.
				J π : L=1 in (p,p).
7253.6 2	(2)- ^a	F	3.4 keV 5	T=1(+0).
				J π : L=1 in (p,p).
7285.62 11	0-, (1,2)&	F		T=0.
7291.33 9	(4,3)+&	F	55 eV 15	T=0.
				J π : L=2 in (p,p).
7308.22 5	(2+)&	F		T=1.
7347.89 10	(4)-&	F H	1.3 keV 2	T=1(+0).
				J π : L=1 in (p,p).
7366.25 11	(5+) [#]	F		T=0.
				J π : spin 5 from 1996Br06. Parity from a comparison of Γ_p from (p, γ) and (^3He ,d) 1996Il01.
7396.92 5	(2)+&	F	45 eV 11	T=0.
				J π : L=0 in (p,p).
7398.70 10	(3)-	F	1.9 keV 3	T=1.
				J π : L=1 in (p,p).
7409.62 8	(4)-&	F H	230 eV 60	T=1(+0).
				J π : L=1 in (p,p).
7425.07 7	(4)+&	F	65 eV 15	T=0.
				J π : L=2 in (p,p).
7439.50 14	0, (1,2)&	F		T=1.
7444.16 16	(1)-&	F	45 eV 10	T=0.
				J π : L=1 in (p,p).
7455.34 19	1+&	F K		T=0.
				J π : L=0 in (^3He ,t).
7464.44 11	(3+)&	F		T=0+1.
7495.38 4	(3)+&	F o	80 eV 20	T=0+1.
				J π : From (p,p)-1984Ad07, L=0 in (p,p).
7497 2	(2)-&	F o	750 eV 200	T=0(+1).
				J π : L=1 in (p,p).
7529.26 5	(6-)&	EFGH L		T=0.
7539.52 11	(2)-&	F	2.1 keV 3	T=1.
				J π : L=1 in (p,p).
7548.20 9	(5-)&	EF H L		T=0.
7557.56 25	(2)+ ^a	F	170 eV 40	T=0.
				J π : L=0 in (p,p).
7561.2 2	(2)+ ^a	F	3.1 keV 5	T=1.
				J π : L=0 in (p,p).
7591.55 10	(4,3)+&	F	17 eV 4	T=0.
				J π : L=2 in (p,p).
7596.06 12	(5+)&	F		T=0.

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Adopted Levels, Gammas (continued) ^{26}Al Levels (continued)

E(level) [†]	J π	XREF		T _{1/2} ^b	Comments
7604.80 10	(2) ⁻ &	F	K	500 eV 80	T=0(+1). J π : L=1 in (p,p).
7622.68 10	(1+)&	F	o		T=0.
7627.52 12	(5)+&	F	o	10 eV 3	T=1. J π : L=2 in (p,p).
7647.8 4	(1+, 2+)&	F	o	23 eV 14	T=0.
7761.84 10	(3) ⁻ & ^a	F			T=0. J π : L=1 in (p,p).
7772.25 6	(3+)&	F			T=0.
7773 2	(1) ⁻ a	F		5.3 keV 8	T=0. J π : L=1 in (p,p).
7813.63 18	1+a	F	K	2.7 keV 3	T=0+1. J π : L=2 in (p,p), L=0 in (³ He,t).
7824.66 15	(4) ⁻ & ^a	F		930 eV 140	T=0. J π : L=1 in (p,p).
7831.61 7	(4)+&	F		110 eV 30	T=0. J π : L=2 in (p,p).
7865.0 3	(2)+&	F		6.6 keV 10	J π : L=2 in (p,p). T=0(+1). J π : L=0 in (p,p).
7874.29 15	(3)+&	F		1.2 keV 2	J π : L=2 in (p,p). T=0. J π : L=2 in (p,p).
7879.6 3	(1+)&	F		3.7 keV 4	T=0+1. J π : The large spectroscopic factor S(p,p ₁)=480 100 (1986En04) value only admits l _{p1} =0 (footnote in 1990En08).
7891.17 9	(4+)& ^a	F	o	900 eV 140	T=1. J π : L=2 in (p,p).
7921.27 14	(5+, 6+)&	F	o		T=0.
7938.79 8	(3)+& ^a	F	o	1.7 keV 3	T=1. J π : L=0 in (p,p).
7953.35 6	(4)+&	F		320 eV 50	T=1. J π : L=2 in (p,p).
7982 2	(2)+&	F		12 keV 2	T=1. J π : L=0 in (p,p).
8000.63 7	(1) ⁻ &	F		850 eV 130	T=1. J π : L=1 in (p,p).
8008.08 9	(2)+& ^a	F		850 eV 130	T=(0). J π : L=0 in (p,p).
8011	(5) ⁻ &	EFGH	L	140 eV 40	T=1. J π : L=3 in (p,p).
8035.7 3		F			
8046.64 10	(3) ⁻ &	F		1.9 keV 3	J π : L=1 in (p,p).
8064 2	(2)+&	F		7.3 keV 11	J π : L=0 in (p,p).
8067	(5) ⁻ &	EFGH	L	200 eV 50	T=1. J π : L=3 in (p,p).
8116 2	(3+) ^a	F		5.9 keV 9	
8130 2	(1-, 2-) ^a	F		1.2 keV 2	
8131 2	(3-) ^a	F		2.7 keV 4	
8164 2	(1-) ^a	F		10.5 keV 16	
8174 2	(3+) ^a	F		23 keV 3	
8186 2	(4+, 5+) ^a	F	O		%p=70 11 (2012Ch31).
8227 2	(4+) ^a	F		0.61 keV 9	
8249 2	(2-) ^a	F		11 keV 2	
8256 2	(4-) ^a	F		0.25 keV 6	
8261 2	(3-) ^a	F		9.6 keV 14	
8272 2	(2-) ^a	F	K	8.2 keV 12	
8294 2	(3+) ^a	F		25 keV 4	
8310 2	(2-) ^a	F		1.5 keV 2	
8347 2	(3-) ^a	F		40 keV 6	
8369 30			O		
8531 1	(4)§	F	K		T=1.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{26}Al Levels (continued)

E(level) [†]	J π	XREF		Comments
8602 1	(5, 6) ⁺ #	F	O	
8747 1	(6 ⁺)#	F		T=(1).
8774 4			K	
8815 19			O	%p=78 36 (2012Ch31).
8924 1	(4) [§]	F	K	T=1. J π : L=0 in (^3He ,t) inconsistent with spin assignment, if considered to be the same state.
9007 4			K	
9060 1	(4) [§]	F	O	T=1. %p=48 15 (2012Ch31).
9271 1		EF	H	T=1. XREF: E(9260). E(level),J π : Doublet with J π =6 ⁻ and 4 components (1996Br06 – (p, γ)).
9286 1	(5) [#]	F		T=1.
9311 1	(3 ⁺ , 4) [§]	F		T=1.
9397 21			K O	XREF: K(9430). %p=73 35 (2012Ch31).
9547 22			O	
9620			K	
9720 1		F		E(level): Doublet with 7 ⁺ and (3 ⁺ ,4) components. 7 ⁺ component populates 6695 keV level.
9860			K	
9960 10	(5 ⁻) [‡]	E	O	T=0. XREF: O(9920).
9986 1	(7 ⁺)#	F		T=1.
10240			K	
10450			K	
10660 10	(6 ⁻) [‡]	E	J	T=0.
10810			K	
11220			K	
11500			K	
11620			K	
11970 10		E	G K	XREF: K(12010). E(level): From (α ,d).
12405 15		E	G K	E(level): From (^3He ,d),(d,n).
12554 15		E	G	E(level): From (^3He ,d),(d,n).
13250 20		E	G	
13570	(1 ⁺)		K	J π : From 2006Ze01 (^3He ,t).
13910 20	(6 ⁻) [‡]	E		T=0.
14050 20		E	G	
14530			K	
14744 20		G		
14880			K	
15371 20		G		
15910			K	
16550 20		G		
18320			K	

[†] From 1988En01 (p, γ), except otherwise noted.[‡] From (A,D), based on angular distribution measurements and DWBA calculations.[§] From I(0°)/I(75°) measurements (1996Br06 – (p, γ)).[#] From σ_g (θ) measurements (1996Br06 – (p, γ)).[@] For triplet L=0 in (p,n); L=0+2 in (^3He ,p); L=4 in (d, α); natural parity for a doublet.[&] From γ decay and feeding along with L values (some cases) – see Table 26.19 in 1990En08. Additional arguments, if any, are noted as comments. For detailed data – see Table 26.21b (1990En08) and Table 26i (1998En04).^a From (p,p) (1984Ad07) cross section measurements and analysis.^b Half-life or total width. Total width from (p, γ).^c From 1988En01.^d From 1983Ke05.

Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Al})$

E(level)	$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\ddagger}$	Mult.	δ	Comments
416.852	416.848	100	[E2]		B(E2)(W.u.)=8.19 12.
1057.739	829.3 4	100	M1		B(M1)(W.u.)=1.5 3. E γ : From 1968Bi05. Other: 829.4 8 (1975Ha21).
1759.034	701.285	2.0 1			
	1342.145	100.0 1			
1850.62	1433.73	0.7 1	[E2]		B(E2)(W.u.)=4.4 8.
	1622.0 7	100.0 1	M1		B(M1)(W.u.)=0.160 15. E γ : Weighted average of 1622.3 10 (1975Ha21) and 1621.7 9 (1968Bi05).
2068.86	1651.95	100.0 15			
	2068.77	44.9 15	(M1+)E2		δ : ∞ (1971Sh19). B(E2)(W.u.)=3.3 6. B(M1)(W.u.)=0.060 17.
2069.47	218.85	0.053 13	[M1]		B(M1)(W.u.)=0.091 18.
	310.43	0.23 3	[M1]		B(M1)(W.u.)=1.14 17.
	1011.71	100.0 12	[M1]		B(M1)(W.u.)=0.075 11.
	1652.56	28.4 11	[M1]		B(E2)(W.u.)=12.6 24.
	1841.09	4.0 5	E2		
2071.64	221.02	0.045 11			
	1654.73	11.9 10	[E2]		B(E2)(W.u.)=2.9 6.
	1842.8 7	100 1	M1		E γ : Weighted average of 1844.2 20 (1975Ha21) and 1842.6 7 (1968Bi05). B(M1)(W.u.)=0.0086 17.
2365.150	295.678	100 2	[M1]		B(M1)(W.u.)=0.54 14.
	606.108	2.90 10			
	1307.375	26.9 8	[E2]		B(E2)(W.u.)=5.5 14.
	1948.219	64.7 20			
	2365.034	1.75 8	[E2]		B(E2)(W.u.)=0.019 5.
2545.367	475.892	100.0 15	[M1]		B(M1)(W.u.)=0.20 5.
	786.320	4.9 3			
	1487.582	3.7 3	[E2]		B(E2)(W.u.)=0.62 16.
	2128.421	38.2 15	M1+E2	+1.5 4	B(M1)(W.u.)=0.00026 12; B(E2)(W.u.)=0.74 22. Mult., δ : From 1969Bi04, based on directional correlation results.
	2545.232	0.31 9	[E2]		B(E2)(W.u.)=0.0035 14.
2660.92	589.27	5.6 13			
	591.44	41.0 16	[M1]		B(M1)(W.u.)=0.009 9.
	810.29	2.5 3			
	901.87	1.02 8			
	1603.13	14.8 5			
	2243.96	100 3			
2740.03	2323.07	0.81 20	[E2]		B(E2)(W.u.)=0.47 13.
	2511.59	100.00 20	M1		B(M1)(W.u.)=0.044 5.
2913.40	843.92	100.0 13	[M1]		B(M1)(W.u.)=0.365 23.
	1062.76	1.55 6			
	1154.34	1.17 6			
	1855.59	1.17 6			
	2496.42	43.7 13			
3073.63	1004.14	100.0 6	[M1]		B(M1)(W.u.)=0.093 15.
	1222.98	3.23 10	[E2]		B(E2)(W.u.)=6.3 11.
	1314.56	0.44 5			
	2015.81	14.7 5	[E2]		B(E2)(W.u.)=2.3 4.
	2656.63	0.60 24			
	3073.43	0.95 11	[E2]		B(E2)(W.u.)=0.018 4.
3159.889	614.514	2.24 8	[M1]		B(M1)(W.u.)=0.39 8.
	794.726	0.35 8	[M1]		B(M1)(W.u.)=0.028 9.
	1088.224	4.25 13	[M1]		B(M1)(W.u.)=0.13 3.
	1309.233	0.55 5	[M1]		B(M1)(W.u.)=0.0098 22.
	1400.814	23.1 6	[M1]		B(M1)(W.u.)=0.34 7.
	2102.058	25.7 8	M1		B(M1)(W.u.)=0.09 3.
	2742.881	100.0 11	M1		B(M1)(W.u.)=0.16 6.
	2931.406	0.69 8	E2		B(E2)(W.u.)=0.72 17.
3402.65	1037.48	0.84 11	[E2]		B(E2)(W.u.)=7.4 17.
	1333.75	9.3 4			
	2985.61	100.0 18	[E2]		B(E2)(W.u.)=4.4 8.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Al})$ (continued)

E(level)	$E\gamma^{\dagger}$	$I\gamma^{\ddagger}$	Mult.	Comments
3402.65	3402.41	64.9 18	(M1+E2)	Mult.: From γ -ray angular distribution and strength measurements (1971Sh19). B(E2)(W.u.)=1.5 3.
3507.63	1438.73	0.32 7	[E2]	B(E2)(W.u.)=3.8 11.
	3507.37	100.0 1	(M1+)E2	Mult., δ : From 1971Sh19. $\delta = \infty$. B(E2)(W.u.)=13.7 25.
3596.34	1526.82	100.00 22	[M1]	B(M1)(W.u.)=0.32 6.
	1745.66	1.07 7	[E2]	B(E2)(W.u.)=4.2 8.
	2538.47	3.48 11	[E2]	B(E2)(W.u.)=2.1 4.
	3179.28	0.20 4		
	3596.07	4.02 22	[E2]	B(E2)(W.u.)=0.42 8.
3674.92	1129.53	3.5 4		
	1309.73	14.2 7		
	1606.01	1.75 18		
	1915.81	48.0 14	[E2]	B(E2)(W.u.)=8.5 12.
	3257.85	100.0 16		
	3674.64	7.7 4		
3680.68	520.79	0.28 4	[M1]	B(M1)(W.u.)=0.049 11.
	767.27	0.13 5		
	1611.16	100.00 21	[M1]	B(M1)(W.u.)=0.59 10.
	1829.99	0.19 4	[E2]	B(E2)(W.u.)=1.3 4.
	1921.57	1.23 6		
	2622.80	2.79 21	[E2]	B(E2)(W.u.)=3.1 6.
	3263.61	1.77 8		
	3680.40	0.77 8	[E2]	B(E2)(W.u.)=0.16 4.
3723.81	1062.87	0.35 9		
	2665.92	0.44 9		
	3495.25	100.0 1	M1	B(M1)(W.u.)=0.12 4.
3750.90	591.00	23.2 14	[M1]	B(M1)(W.u.)=0.76 22.
	837.49	0.57 10		
	1385.71	0.19 10		
	1681.37	100 3	[M1]	B(M1)(W.u.)=0.14 4.
	1900.20	0.39 10		
	1991.78	0.28 9		
	2693.01	13.9 4		
	3333.82	9.0 12		
3753.63	1013.58	2.2 3	[M1]	B(M1)(W.u.)=0.08 4.
	1681.93	11.0 3	[M1]	B(M1)(W.u.)=0.09 4.
	1902.93	3.0 4	[M1]	B(M1)(W.u.)=0.017 7.
	2695.74	100.0 5	[M1]	B(M1)(W.u.)=0.19 8.
3921.96	3921.64	100		
3962.83	1222.77	0.7 3	[E2]	B(E2)(W.u.)=6 3.
	1301.88	2.1 10		
	1597.63	4.9 4		
	1893.29	100.0 14	[M1]	B(M1)(W.u.)=0.062 9.
	2112.12	2.3 3	[E2]	B(E2)(W.u.)=1.28 25.
	2203.70	3.1 4		
	2904.92	15.9 6	[E2]	B(E2)(W.u.)=1.8 3.
	3545.72	5.6 4		
	3962.50	7.9 4	[E2]	B(E2)(W.u.)=0.19 3.
3977.91	1906.19	1.5 3	[E1]	B(E1)(W.u.)<1.0 $\times 10^{-6}$.
	2127.20	100.0 16	[E1]	B(E1)(W.u.)<5.0 $\times 10^{-5}$.
	2919.99	59.7 16	[E1]	B(E1)(W.u.)<1.1 $\times 10^{-5}$.
4191.92	595.57	1.50 12	[M1]	B(M1)(W.u.)=0.18 8.
	1278.49	0.66 7	[M1]	B(M1)(W.u.)=0.008 4.
	1530.95	0.9 3		
	1646.50	3.57 17	[M1]	B(M1)(W.u.)=0.021 9.
	1826.70	15.8 9	[M1]	B(M1)(W.u.)=0.07 3.
	2122.97	40.6 12	[M1]	B(M1)(W.u.)=0.11 5.
	2432.76	6.6 3		
	3774.77	100.0 15	[M1]	B(M1)(W.u.)=0.048 20.
	4191.56	0.41 10	[E2]	B(E2)(W.u.)=0.046 22.
4205.86	530.93	0.061 15		
	1132.20	0.79 5		

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Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Al})$ (continued)

E(level)	$E_{\gamma}^{\dagger}$	$I\gamma^{\ddagger}$	Mult.	Comments
4205.86	1292.43	0.95 8	[E2]	B(E2)(W.u.)=3.5 7.
	1544.89	12.3 8	[E2]	B(E2)(W.u.)=18 4.
	1660.44	4.8 3		
	1840.64	10.3 8		
	2136.91	16.1 11		
	2446.70	1.67 11	[E2]	B(E2)(W.u.)=0.25 5.
	3788.71	100.0 15		
	4205.49	4.4 3		
	2279.76	100.0 6	[M1]	B(M1)(W.u.)=0.19 7.
	2590.17	0.85 10		
4349.34	3291.38	1.9 2	[E2]	B(E2)(W.u.)=0.64 23.
	3932.17	2.8 6		
	4348.95	0.64 11	[E2]	B(E2)(W.u.)=0.053 20.
	1270.80	5.7 5	[E1]	B(E1)(W.u.)=0.00022 6.
	1885.28	1.6 5	[E1]	B(E1)(W.u.)=1.9 $\times 10^{-5}$ 8.
	2065.48	3.0 10	[E1]	B(E1)(W.u.)=2.7 $\times 10^{-5}$ 11.
	2361.13	100 5	[E1]	B(E1)(W.u.)=0.00060 14.
	2579.96	1.0 5	[E1]	B(E1)(W.u.)=5. $\times 10^{-6}$ 3.
	2671.54	4.8 10	[E1]	B(E1)(W.u.)=2.0 $\times 10^{-5}$ 6.
	3372.74	1.1 3	[E1]	B(E1)(W.u.)=2.3 $\times 10^{-6}$ 8.
4480.48	4013.53	48 5	[E1]	B(E1)(W.u.)=5.9 $\times 10^{-5}$ 15.
	1740.39	37.0 14	[E1]	B(E1)(W.u.)=0.00039 8.
	2408.72	100.0 23	[E1]	B(E1)(W.u.)=0.00039 8.
	2629.72	77.3 23	[E1]	B(E1)(W.u.)=0.00023 5.
	3422.50	11.8 11	[E1]	B(E1)(W.u.)=1.6 $\times 10^{-5}$ 4.
	867.22	0.48 6	[M1]	B(M1)(W.u.)>0.0070.
	1634.46	1.00 8		
	1807.82	1.48 10		
	1886.93	0.42 10		
	2002.47	11.0 4	[M1]	B(M1)(W.u.)>0.013.
4547.92	2182.67	6.87 21		
	2476.15	2.71 13		
	2697.15	0.17 6		
	2788.72	14.6 4		
	3489.93	100.0 21		
	4130.71	68.8 21		
	4319.23	1.19 10	[E2]	B(E2)(W.u.)>0.043.
	848.26	3.8 4	[M1]	B(M1)(W.u.)=0.13 6.
	918.47	1.66 10	[M1]	B(M1)(W.u.)=0.045 19.
	924.23	6.5 4	[M1]	B(M1)(W.u.)=0.17 7.
4599.17	1525.49	2.10 21	[M1]	B(M1)(W.u.)=0.012 6.
	1685.71	7.1 4	[M1]	B(M1)(W.u.)=0.031 13.
	1938.17	13.8 6	[M1]	B(M1)(W.u.)=0.040 16.
	2053.72	10.5 4	[M1]	B(M1)(W.u.)=0.026 11.
	2233.92	5.45 21		
	2530.18	5.45 21		
	2839.97	100.0 19	[M1]	B(M1)(W.u.)=0.09 4.
	4181.95	53.0 17		
	1462.45	3.4 6	[E1]	B(E1)(W.u.)=5 $\times 10^{-5}$ 2.
	1548.70	14.1 13	[E1]	B(E1)(W.u.)=0.00018 7.
4622.38	1882.28	100 3	[E1]	B(E1)(W.u.)=0.00069 24.
	1961.38	60.0 16	[E1]	B(E1)(W.u.)=0.00037 13.
	2076.92	6.6 19	[E1]	B(E1)(W.u.)=3.4 $\times 10^{-5}$ 16.
	2257.12	3.8 9	[E1]	B(E1)(W.u.)=1.5 $\times 10^{-5}$ 7.
	2552.77	57.2 25	[E1]	B(E1)(W.u.)=0.00016 6.
	2771.60	28.4 22	[E1]	B(E1)(W.u.)=6.2 $\times 10^{-5}$ 22.
	3564.38	4.7 9	[E1]	B(E1)(W.u.)=4.8 $\times 10^{-6}$ 19.
	4205.16	35.9 25	[E1]	B(E1)(W.u.)=2.2 $\times 10^{-5}$ 8.
	1024.67	0.9 4	[M1]	B(M1)(W.u.)>0.035.
	1631.68	1.1 4	[M1]	B(M1)(W.u.)>0.011.
4705.37	2159.91	27.9 9	[M1]	B(M1)(W.u.)>0.12.
	2340.11	44.7 14	[M1]	B(M1)(W.u.)>0.15.
	2636.37	1.05 18		

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Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Al})$ (continued)

E(level)	$E_{\gamma^{\dagger}}$	$I_{\gamma^{\ddagger}}$	Mult.	Comments
4705.37	4288.14	0.53 18		
	4704.91	100.0 18		
4773.35	581.42	13.7 10	[M1]	B(M1)(W.u.)=0.056 10.
	1092.65	1.27 10		
	1098.41	0.4 1		
	1176.98	0.87 13		
	1370.66	2.0 7		
	1699.66	11.7 7		
	1859.88	19.3 7	[E2]	B(E2)(W.u.)=3.9 6.
	2112.34	87 3	[E2]	B(E2)(W.u.)=9.4 15.
	2227.88	18.0 7		
	2408.08	27 1		
	2704.34	10 1		
	3014.13	1.3 3	[E2]	B(E2)(W.u.)=0.024 7.
	4356.10	100 3		
	4772.88	40.3 17		
4939.64	1185.98	5.25 25	E1	B(E1)(W.u.)=0.00028 6.
	1779.69	1.3 4	[E1]	B(E1)(W.u.)=2.1 $\times 10^{-5}$ 8.
	2199.51	0.6 4	[E1]	B(E1)(W.u.)=5. $\times 10^{-6}$ 4.
	2278.61	1.0 3	[E1]	B(E1)(W.u.)=8 $\times 10^{-6}$ 3.
	2867.83	7.1 15	[E1]	B(E1)(W.u.)=2.7 $\times 10^{-5}$ 8.
	2870.00	6.1 15		
	3088.82	1.0 4	[E1]	B(E1)(W.u.)=3.0 $\times 10^{-6}$ 14.
	3180.40	0.63 25	[E1]	B(E1)(W.u.)=1.8 $\times 10^{-6}$ 8.
	3881.59	1.5 5	[E1]	B(E1)(W.u.)=2.3 $\times 10^{-6}$ 9.
	4710.87	100.0 13	[E1]	B(E1)(W.u.)=8.6 $\times 10^{-5}$ 18.
4940.79	1265.84	0.56 19		
	1433.12	3.33 19		
	1867.09	0.46 15	[E2]	B(E2)(W.u.)=0.56 24.
	2395.30	39.8 15	[E2]	B(E2)(W.u.)=14 4.
	2575.50	38.1 11	[E2]	B(E2)(W.u.)=9.3 24.
	2871.76	1.3 4		
	4523.51	100.0 19	[E2]	B(E2)(W.u.)=1.5 4.
	4940.28	2.0 4		
4952.30	760.37	2.3 4	[M1]	B(M1)(W.u.)=0.066 23.
	1792.34	100.0 18	[M1]	B(M1)(W.u.)=0.22 7.
	2038.81	1.58 18		
	2212.17	1.75 18	[E2]	B(E2)(W.u.)=2.3 8.
	2406.81	1.1 4		
	2882.66	44.0 14	[M1]	B(M1)(W.u.)=0.023 7.
	3101.48	4.6 4	[E2]	B(E2)(W.u.)=1.1 4.
	3894.25	3.3 4	[E2]	B(E2)(W.u.)=0.26 9.
	4535.02	16.5 5		
5006.66	2093.17	4.2 8	[E1]	B(E1)(W.u.)=1.9 $\times 10^{-5}$ 6.
	2266.52	3.5 8	[E1]	B(E1)(W.u.)=1.3 $\times 10^{-5}$ 5.
	2345.63	3.5 9	[E1]	B(E1)(W.u.)=1.1 $\times 10^{-5}$ 4.
	2937.01	100 3	[E1]	B(E1)(W.u.)=0.00016 5.
	3155.83	2.9 12	[E1]	B(E1)(W.u.)=3.8 $\times 10^{-6}$ 19.
	3247.41	10.8 15	[E1]	B(E1)(W.u.)=1.3 $\times 10^{-5}$ 4.
	3948.60	29.2 15	[E1]	B(E1)(W.u.)=2.0 $\times 10^{-5}$ 5.
5010.24	1256.58	2.4 8	[M1]	B(M1)(W.u.)>0.043.
	4781.46	100.0 8	[M1]	B(M1)(W.u.)>0.033.
5131.93	782.58	0.72 7	[M1]	B(M1)(W.u.)>0.049.
	926.05	1.17 5	[M1]	B(M1)(W.u.)>0.048.
	939.99	0.20 2		
	1169.07	4.5 13	[M1]	B(M1)(W.u.)>0.092.
	1451.21	1.01 15		
	1456.97	0.27 5		
	1535.54	9.2 2	[M1]	B(M1)(W.u.)>0.083.
	1729.22	11.2 5		
	1971.96	0.61 7	[E2]	B(E2)(W.u.)>3.8.
	2058.21	42.8 13	[M1]	B(M1)(W.u.)>0.16.
	2586.42	2.17 16		

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Al})$ (continued)

E(level)	$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\ddagger}$	Mult.	Comments
5131.93	2766.62	100 2	[M1]	B(M1)(W.u.)>0.15.
	3062.27	11.4 22	[E2]	B(E2)(W.u.)>7.8.
	3062.88	35.9 22	[M1]	B(M1)(W.u.)>0.041.
	3372.66	0.11 2	[E2]	B(E2)(W.u.)>0.046.
	4714.62	1.4 2		
5141.68	5131.38	0.94 7		
	1178.82	1.6 3	[M1]	B(M1)(W.u.)>0.043.
	1545.29	1.7 4	[M1]	B(M1)(W.u.)>0.020.
	2776.37	0.86 12		
	3069.84	1.0 4		
	3382.41	14.8 12		
	4083.59	3.6 5		
	4724.36	100.0 25		
	1471.25	35.7 24	[M1]	B(M1)(W.u.)>0.043.
	3123.27	100 7	[M1]	B(M1)(W.u.)>0.013.
5195.11	3344.26	21.4 24	[M1]	B(M1)(W.u.)>0.0022.
	4137.02	81 7	[M1]	B(M1)(W.u.)>0.0044.
5245.28	539.90	5.9 4	[M1]	B(M1)(W.u.)=0.32 9.
	895.92	0.70 9		
	1039.40	0.93 11		
	1053.34	100.0 22	[M1]	B(M1)(W.u.)=0.72 19.
	1282.42	3.91 22		
	1494.33	0.17 7	[E2]	B(E2)(W.u.)=1.1 6.
	1564.55	0.93 9	[M1]	B(M1)(W.u.)=0.0021 6.
	1570.31	0.41 11		
	1648.88	4.6 11		
	1737.59	0.54 9	[E2]	B(E2)(W.u.)=1.6 5.
	1842.56	3.3 11		
	2171.55	11.3 4		
	2331.77	12.2 4	[E2]	B(E2)(W.u.)=8.4 22.
	2584.22	6.3 2	[E2]	B(E2)(W.u.)=2.6 7.
	2699.76	5.4 4		
	2879.96	19.8 7		
	3175.60	8.3 4	[E2]	B(E2)(W.u.)=1.2 4.
	3485.99	16.1 7	[E2]	B(E2)(W.u.)=1.5 4.
	4827.94	8.5 4		
	5244.71	7.8 4		
5395.53	773.14	0.85 11	[E2]	B(E2)(W.u.)=27 22.
	796.35	4.13 22	[E1]	B(E1)(W.u.)=0.0004 3.
	1203.58	13.3 4	[E1]	B(E1)(W.u.)=0.0004 3.
	1720.55	0.33 9	[E1]	B(E1)(W.u.)=4. $\times 10^{-6}$ 3.
	1799.12	6.52 22	[E1]	B(E1)(W.u.)=6. $\times 10^{-5}$ 5.
	1992.80	0.24 11	[E1]	B(E1)(W.u.)=1.7 $\times 10^{-6}$ 15.
	2321.79	4.13 22	[E1]	B(E1)(W.u.)=1.8 $\times 10^{-5}$ 14.
	2849.99	2.83 22	[E1]	B(E1)(W.u.)=7. $\times 10^{-6}$ 6.
	3030.19	7.83 22	[E1]	B(E1)(W.u.)=1.5 $\times 10^{-5}$ 12.
	3326.44	4.57 22	[E1]	B(E1)(W.u.)=7. $\times 10^{-6}$ 6.
	4978.16	100.0 22	[E1]	B(E1)(W.u.)=4. $\times 10^{-5}$ 3.
	5394.93	71.7 22	[E1]	B(E1)(W.u.)=2.5 $\times 10^{-5}$ 20.
5431.23	883.29	2.33 21	[E1]	B(E1)(W.u.)=0.0006 3.
	950.73	0.82 21	[M1]	B(M1)(W.u.)=0.005 3.
	1677.54	79 9	[E1]	B(E1)(W.u.)=0.0028 15.
	2770.15	1.5 3	[E1]	B(E1)(W.u.)=1.2 $\times 10^{-5}$ 7.
	3359.36	36 15	[E1]	B(E1)(W.u.)=0.00016 11.
	3361.53	100 15	[E1]	B(E1)(W.u.)=0.00045 24.
	3580.34	18.8 6	[E1]	B(E1)(W.u.)=7. $\times 10^{-5}$ 4.
	3671.92	2.4 3	[E1]	B(E1)(W.u.)=8. $\times 10^{-6}$ 5.
	4373.09	82 6	[E1]	B(E1)(W.u.)=0.00017 9.
	5202.36	55.8 18	[E1]	B(E1)(W.u.)=7. $\times 10^{-5}$ 4.
5456.71	751.33	1.1 3	[E1]	B(E1)(W.u.)=0.00045 17.
	908.77	15.3 8	[E1]	B(E1)(W.u.)=0.0036 9.
	1705.75	1.4 6	[E1]	B(E1)(W.u.)=4.9 $\times 10^{-5}$ 24.
	1775.96	1.4 6	[E1]	B(E1)(W.u.)=4.4 $\times 10^{-5}$ 22.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Al})$ (continued)

E(level)	$E_{\gamma^{\dagger}}$	$I_{\gamma^{\dagger}}$	Mult.	Comments
5456.71	1781.72	1.4 6	[E1]	B(E1)(W.u.)= 4.3×10^{-5} 22.
	1860.30	1.1 3	[E1]	B(E1)(W.u.)= 3.0×10^{-5} 11.
	2296.71	14.4 8	[E1]	B(E1)(W.u.)=0.00021 5.
	2382.96	15.6 8	[E1]	B(E1)(W.u.)=0.00020 5.
	2795.63	53.3 25	[E1]	B(E1)(W.u.)=0.00043 11.
	2911.17	3.3 6	[E1]	B(E1)(W.u.)= 2.3×10^{-5} 7.
	3091.36	6.1 6	[E1]	B(E1)(W.u.)= 3.6×10^{-5} 10.
	3387.00	27.5 11	[E1]	B(E1)(W.u.)=0.00012 3.
	3697.39	18.3 8	[E1]	B(E1)(W.u.)= 6.3×10^{-5} 16.
	5039.33	100 8	[E1]	B(E1)(W.u.)=0.00014 4.
5461.87	2301.87	26 9		
	2548.34	87 17		
	2721.69	74 13		
	2800.79	35 9		
	3610.98	35 13		
	3702.55	100 13		
	4403.73	78 13		
5487.93	2085.19	5.3 19		
	2414.18	100 5		
	3122.58	14 3		
	3418.83	22 3		
	5487.30	16 3		
5494.51	946.57	2.42 22	[M1]	B(M1)(W.u.)>0.11.
	1898.09	3.1 10		
	2334.51	4.7 6	[M1]	B(M1)(W.u.)>0.015.
	3424.80	100.0 11	[M1]	B(M1)(W.u.)>0.099.
5513.48	381.55	0.70 14	[M1]	B(M1)(W.u.)=0.029 7.
	808.10	1.62 16	[M1]	B(M1)(W.u.)=0.0072 11.
	1164.11	3.11 19		
	1321.52	100 3	[M1]	B(M1)(W.u.)=0.101 12.
	1762.52	0.78 19	[E2]	B(E2)(W.u.)=0.60 17.
	1917.06	1.1 3		
	2599.94	2.89 22	[E2]	B(E2)(W.u.)=0.32 5.
	2852.39	1.97 22	[E2]	B(E2)(W.u.)=0.136 22.
	2967.93	1.97 24		
	3148.12	16.5 5		
	3444.37	11.6 5		
	3754.15	71.9 22	[E2]	B(E2)(W.u.)=1.26 15.
	5096.09	25.7 11		
	5512.85	30.3 11		
5544.56	1581.68	6.4 11	[M1]	B(M1)(W.u.)=0.007 6.
	1793.59	71 4	[M1]	B(M1)(W.u.)=0.05 4.
	1820.68	4.3 14		
	1948.14	18 4	[M1]	B(M1)(W.u.)=0.010 9.
	2470.80	7.1 14		
	2631.02	16 3		
	2883.47	7.9 14		
	2999.01	8.6 18		
	3179.20	48 3		
	3472.67	8.6 14		
	3693.66	3.2 11		
	3785.23	40.7 25		
	4486.40	10.0 18		
	5127.16	100 7		
	5315.67	5.7 14	[E2]	B(E2)(W.u.)=0.03 2.
5569.16	863.77	23 7		
	3500.05	39 11		
	5568.52	100 13		
5584.99	1037.05	7.2 4	[M1]	B(M1)(W.u.)>0.20.
	1831.29	2.8 4	M1	B(M1)(W.u.)>0.014.
	2424.98	1.2 4		
	2671.44	3.0 4		
	3825.65	1.6 5		

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Al})$ (continued)

E(level)	$E\gamma^{\dagger}$	$I\gamma^{\ddagger}$	Mult.	Comments
5584.99	5356.09	100.0 8	M1	B(M1)(W.u.)>0.021.
5598.30	2438.29	100 8	[E1]	B(E1)(W.u.)=0.0011 5.
	3528.57	78 8	[E1]	B(E1)(W.u.)=0.00029 11.
	5180.89	73 8	[E1]	B(E1)(W.u.)=8×10 ⁻⁵ 4.
5671.04	1917.33	100 4	M1	B(M1)(W.u.)>0.051.
	1990.28	6.5 16	[E2]	B(E2)(W.u.)>4.2.
	2511.02	46.9 20	[M1]	B(M1)(W.u.)>0.011.
	4612.86	15.9 24		
	5253.61	11.8 18	[E2]	B(E2)(W.u.)>0.060.
	5442.12	22 4	M1	B(M1)(W.u.)>0.00049.
5676.07	1076.88	3.56 18	[E1]	B(E1)(W.u.)=0.00045 21.
	1484.10	15.6 4	[E1]	B(E1)(W.u.)=0.0008 4.
	1995.31	3.02 18	[E1]	B(E1)(W.u.)=6×10 ⁻⁵ 3.
	2001.07	0.49 18	[E1]	B(E1)(W.u.)=1.0×10 ⁻⁵ 6.
	3130.50	7.78 22	[E1]	B(E1)(W.u.)=4.0×10 ⁻⁵ 19.
	3310.69	1.76 18	[E1]	B(E1)(W.u.)=8×10 ⁻⁶ 4.
	3606.94	0.84 16	[E1]	B(E1)(W.u.)=2.8×10 ⁻⁶ 14.
	5258.64	100.0 22	[E1]	B(E1)(W.u.)=0.00011 5.
	5675.40	88.9 22	[E1]	B(E1)(W.u.)=8×10 ⁻⁵ 4.
5692.15	550.46	0.52 16	[E1]	B(E1)(W.u.)=0.0038 19.
	1092.96	0.55 18	[E1]	B(E1)(W.u.)=0.0005 3.
	1144.20	0.48 20	[E1]	B(E1)(W.u.)=0.00039 23.
	1486.24	0.95 18	[E1]	B(E1)(W.u.)=0.00035 16.
	1500.18	41.6 14	[E1]	B(E1)(W.u.)=0.015 6.
	2011.39	4.1 3	[E1]	B(E1)(W.u.)=0.00061 25.
	2095.72	0.66 14	[E1]	B(E1)(W.u.)=9×10 ⁻⁵ 4.
	2532.13	37.5 11	[E1]	B(E1)(W.u.)=0.0028 11.
	2618.38	1.57 20	[E1]	B(E1)(W.u.)=0.00011 5.
	3031.04	0.70 20	[E1]	B(E1)(W.u.)=3.1×10 ⁻⁵ 15.
	3622.41	0.70 18	[E1]	B(E1)(W.u.)=1.8×10 ⁻⁵ 9.
	3932.79	37.3 11	[E1]	B(E1)(W.u.)=0.0007 3.
	5274.72	100.0 23	[E1]	B(E1)(W.u.)=0.0008 4.
5726.38	1377.00	2.2 3	[M1]	B(M1)(W.u.)>0.014.
	1763.49	16.5 8	[M1]	B(M1)(W.u.)>0.049.
	2051.37	1.9 3		
	2129.95	6.5 5	[M1]	B(M1)(W.u.)>0.011.
	2323.62	22 3	[M1]	B(M1)(W.u.)>0.029.
	3361.00	13.5 5		
	3657.24	16.2 8		
	5308.94	89 3		
	5725.70	100 3		
5849.21	707.52	6.5 13	[M1]	B(M1)(W.u.)=0.19 13.
	1301.25	17.5 19	[M1]	B(M1)(W.u.)=0.08 6.
	1657.23	31 4	[M1]	B(M1)(W.u.)=0.07 5.
	2935.63	15 6		
	3108.98	6.7 19		
	3779.44	100 6	[M1]	B(M1)(W.u.)=0.020 12.
	4089.83	15 4		
	5431.75	17 4		
5882.65	740.96	5.3 23	[M1]	B(M1)(W.u.)>0.10.
	750.71	5.1 23	[M1]	B(M1)(W.u.)>0.095.
	1177.25	5.3 19	[M1]	B(M1)(W.u.)>0.026.
	1260.24	7.2 16	[E1]	B(E1)(W.u.)>0.00099.
	1283.45	5.3 12	[M1]	B(M1)(W.u.)>0.020.
	1334.69	100 5	[M1]	B(M1)(W.u.)>0.33.
	1690.67	4.0 16	[M1]	B(M1)(W.u.)>0.0065.
	2722.61	21.6 16		
	2808.86	2.3 9		
	3812.88	27.0 16		
	4031.69	9.5 14	[E2]	B(E2)(W.u.)>0.40.
	4123.26	7 3		
	5465.18	32.6 23		
5916.10	774.41	2.7 5	[E1]	B(E1)(W.u.)>0.0099.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Al})$ (continued)

E(level)	$E_{\gamma^{\dagger}}$	$I_{\gamma^{\ddagger}}$	Mult.	Comments
5916.10	1724.12	14.5 9	[E1]	B(E1)(W.u.)>0.0048.
	2165.10	5 3	[E1]	B(E1)(W.u.)>0.00084.
	2756.05	7.5 9	[E1]	B(E1)(W.u.)>0.00061.
	3002.51	4.3 9	[E1]	B(E1)(W.u.)>0.00027.
	3550.69	3.6 9	[E1]	B(E1)(W.u.)>0.00014.
	3846.32	48.6 16	[E1]	B(E1)(W.u.)>0.0015.
	4065.14	10.7 25	[E1]	B(E1)(W.u.)>0.00027.
	4156.71	15.0 11	[E1]	B(E1)(W.u.)>0.00036.
	4857.87	14 5	[E1]	B(E1)(W.u.)>0.00021.
	5498.62	100 5	[E1]	B(E1)(W.u.)>0.0010.
5924.19	2243.41	40 6	[M1]	B(M1)(W.u.)>0.031.
	2521.41	7.3 13		
	3378.59	100 6		
	3855.02	23 4		
	5923.46	38 4		
5949.93	2196.20	47 6	M1	B(M1)(W.u.)>0.014.
	2789.88	100 9	[M1]	B(M1)(W.u.)>0.015.
	3880.15	50 9	[M1]	B(M1)(W.u.)>0.0027.
	5720.95	32 6	M1	Also, additional γ ray ($I_{\gamma}=65$ 9) from 5949.9 level. B(M1)(W.u.)>0.00055.
6028.02	1021.34	2.5 5	[E1]	
	1088.36	12.3 14	[E1]	
	2050.02	2.0 7	E1	
	2277.01	8.0 20	[M1]	
	2304.10	50.2 16	[M1]	
	3114.42	35.0 11	[M1]	
	3287.77	8.0 16		
	3956.05	6.6 14		
	4268.61	2.7 11		
	4969.77	100 5		
6084.07	688.53	1.29 13	[M1]	B(M1)(W.u.)=0.0054 14.
	1310.68	1.32 16		
	1378.66	15.9 7	[E1]	B(E1)(W.u.)=0.00029 7.
	2409.03	19.6 18		
	2576.30	13.9 5		
	4014.87	100 4		
	6083.30	27.0 9		
6086.47	4016.67	66 21		
	4235.48	62 21		
	4327.05	34 10		
	5857.45	100 21		Also, additional γ ray ($I_{\gamma}=83$ 21) from 6086.5 level.
6120.01	2444.97	9.0 12		
	2717.21	38.2 15		
	4050.81	100.0 15		
6197.56	5968.51	100	E2	
6238.4	1096.7	27.9 25		
	1690.4	36.4 25		
	1807.6	4.6 14		
	2260.4	25 7		
	2484.6	18.2 25		
	2514.5	1.8 11		
	3078.3	4.6 18		
	3324.8	4.3 14		
	3498.1	14 7		
	4168.6	100 4		
	4387.4	6.4 21		
	4478.9	8.2 21		
	5180.1	50 4		
	6009.3	54 4		
	6270.19	1075.06	M1	B(M1)(W.u.)>0.13.
	3110.10	22 3		
	6041.13	100 5	M1	Also, additional γ ray ($I_{\gamma}=41$ 5) from 6270.2 level. B(M1)(W.u.)>0.0085.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Al})$ (continued)

E(level)	$E_{\gamma}^{\dagger}$	$I\gamma^{\ddagger}$	Mult.	Comments
6280.33	1138.62	37 17	[M1]	B(M1)(W.u.)>0.14.
	1148.37	29 14	[M1]	B(M1)(W.u.)>0.10.
	1681.10	29 11	[M1]	B(M1)(W.u.)>0.033.
	2088.32	66 11	[M1]	B(M1)(W.u.)>0.040.
	3120.24	100 23	[M1]	B(M1)(W.u.)>0.018.
6343.46	4210.49	26 11		
	1211.50	14.6 15	[E1]	B(E1)(W.u.)>0.0048.
	1638.03	8.3 22	[E1]	B(E1)(W.u.)>0.0011.
	1744.23	100 4	[E1]	B(E1)(W.u.)>0.011.
	2151.44	30.4 22	[E1]	B(E1)(W.u.)>0.0018.
	3269.61	11.1 24	[E1]	B(E1)(W.u.)>0.00019.
	3797.79	28.3 22	[E1]	B(E1)(W.u.)>0.00030.
	3977.98	8.3 11	[E1]	B(E1)(W.u.)>7.7×10 ⁻⁵ .
	4274.22	18.9 11	[E1]	B(E1)(W.u.)>0.00014.
6363.99	2158.03	26 7		
	2171.97	6 4		
	2612.95	23 3		
	2683.16	48 4		
	2688.92	44 15		
	3818.32	19 7		
	3998.51	30 7		
	4294.75	30 7		
	4604.52	100 11		
	5946.40	44 7		
6414.46	4563.41	100 17		
	5356.13	67 17		
6436.44	1304.47	100 10		
	1731.01	90 8		
	4367.18	18 5		
6495.94	6018.84	49 8		
	769.5	11.5 23		
	1790.5	20.9 21		
	3093.1	45 4		
	3422.0	15.8 21		
	3950.2	2.9 10		
	4130.4	3.1 10		
	6078.2	100 4		
	6494.9	6.2 21		
	694.5	0.28 6		
6610.40	884.5	0.31 3		
	1153.5			
	1214.5	0.69 6		
	1670.4	0.25 3		
	1988.4	0.88 22		
	2011.4	0.38 3		
	2062.4	4.09 22		
	2261.4	0.09 3		
	2404.4	0.79 6		
	2418.4	60.1 9		
	2647.4	0.53 3		
	2860.3	2.89 6		
	2929.3	3.43 9		
	2935.3	2.7 4		
	3014.3	13.49 22		
	3450.3	35.9 6		
	3537.2	0.35 13		
	3697.2	9.56 16		
	3949.2	3.14 6		
	4065.2	4.59 9		
	4245.1	1.48 6		
	4541.1	18.9 3		
	4851.0	50.6 9		
	6192.7	100.0 16		

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Al})$ (continued)

E(level)	$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\ddagger}$
6610.40	6609.6	0.18 1
6695	3187	

† Deduced from level-energy differences, corrected for recoil.

‡ From 1988En01 (p, γ), except otherwise noted.

 ^{26}Si β^+ Decay 1980Wi13,1975Ha21

Parent ^{26}Si : E=0.0; $J\pi=0^+$; $T_{1/2}=2.2453$ s 7; Q(g.s.)=5069.14 8; % β^+ decay=100.

Others: 2008Ma39,1971Mo27.

1980Wi13: ^{26}Si was produced from $^{24}\text{Mg}(^3\text{He},n)^{26}\text{Si}$ reaction, E=12.0 MeV; Ge(Li) detector; Measured: E_{γ} , I_{γ} , deduced beta feeding.

1975Ha21: ^{26}Si was produced from $^{24}\text{Mg}(^3\text{He},n)^{26}\text{Si}$ reaction, E=12.0 MeV; Ge(Li) detector; Measured: E_{γ} , I_{γ} , deduced beta feeding.

 ^{26}Al Levels

E(level)	$J\pi$	$T_{1/2}$
0.0	5+	7.17×10^5 y 24
228.305 13	0+	6.3460 s 8
416.852 3	3+	
1057.739 12	1+	
1759.034 8	2+	
1850.62 3	1+	
2071.64 4	1+	
2740.03 3	1+	
3723.81 4	1+	

 β^+, ϵ Data

E_{ϵ}	E(level)	$I\beta^+{}^{\dagger}$	$I\epsilon^{\dagger}$	Log ft	$I(\epsilon+\beta^+)^{\dagger}$
(1345.33 9)	3723.81	<0.00050	<0.00080	>4.2	<0.0013
(2329.11 9)	2740.03	0.0608 25	0.00099 4	4.54 2	0.0618 25
(2997.50 9)	2071.64	0.289 11	0.00132 5	4.63 2	0.290 11
(3218.52 9)	1850.62	2.72 7	0.00905 25	3.86 1	2.73 7
(4011.40 8)	1057.739	21.9 4	0.0289 6	3.54 1	21.9 4
(4840.83 9)	228.305	75.0 5	0.0477 6	3.49 1	75.0 5

† Absolute intensity per 100 decays.

 $\gamma(^{26}\text{Al})$

I_{γ} normalization: From 829 γ absolute intensity, deduced relative to 511 γ intensity in 1975Ha21.

E_{γ}	E(level)	$I_{\gamma}^{\ddagger\#}$	Mult.	α	Comments
416.848	416.852	<3.67	[E2]	3.70×10^{-4}	I_{γ} : deduced from intensity balance at 416.9 level (transition not reported).
829.3 † 4	1057.739	1000 5	M1		
1342.145	1759.034	<0.98			
1433.73	1850.62	<0.96	[E2]		
1622.0 † 7	1850.62	124.5 23	M1	1.09×10^{-4}	I_{γ} : Others: 134 5 (1975Ha21); 149 16 (1971Mo27).
1654.73	2071.64	1.5 3	[E2]	1.61×10^{-4}	
1844.2 20	2071.64	11.79 27	M1	1.88×10^{-4}	I_{γ} : Others: 16 3 (1975Ha21); 13 3 (1971Mo27).
2323.07	2740.03	<0.28	[E2]	4.77×10^{-4}	
2511.59	2740.03	2.82 10	M1	4.62×10^{-4}	
2665.92	3723.81	<0.15			

Continued on next page (footnotes at end of table)

^{26}Si β^+ Decay 1980Wi13,1975Ha21 (continued) $\gamma(^{26}\text{Al})$ (continued)

E_γ	E(level)	$I_\gamma^\dagger\%$	Mult.	α
3495.25	3723.81	<0.045	M1	8.50×10^{-4}

 † From Adopted Gammas. ‡ From 1980Wi13 except where noted. The existence and/or intensities of extremely weak transitions from 1980Wi13 are not in agreement with adopted data. The impact of these transitions on the decay scheme is insignificant. $^\#$ For absolute intensity per 100 decays, multiply by 0.0218 8.

Decay Scheme

Intensities: I_γ per 100 parent decays **^{27}P β^+ Decay 1996Og01,1985Ay02**Parent ^{27}P : $E=0.0$; $J\pi=1/2^+$; $T_{1/2}=260$ ms 80; $Q(\text{g.s.})=4170$ 40; $\% \beta^+$ decay=0.0700.1996Og01: ^{27}P was produced from $^{nat}\text{Si}(p,x)$, $E=45$ MeV, ΔE -E Si detectors; Measured β^+ delayed Ep, Ip.1985Ay02: ^{27}P was produced from $^{28}\text{Si}(p,2n)$, $E=28$ -50 MeV; Measured β^+ delayed Ep, Ip, $T_{1/2}$. ^{26}Al Levels

E(level)	$J\pi$	$T_{1/2}^\dagger$
0.0	5+	7.17×10^5 y 24
228.305 13	0+	6.3465 s 7

 † From Adopted Levels.

Delayed protons

E(p)	E(^{26}Al)	$I(p)^\dagger\%$	E(^{27}Si)
466 3	228.305	4.2 9	8176
612 2	228.305	45.5 14	8328
731 2	228.305	46.9	8451
1324 4	228.305	3.3 9	9067

 † For intensity per 100 decays, multiply by =0.00070. ‡ From 1996Og01, normalized to $\Sigma I_p=100$.

$^{23}\text{Na}(\alpha, n\gamma)$ 1972Du05, 1971Sh19, 1974Be08

Other: 1972Ma67, 1974Be43, 1974Pr08.

1971Sh19: E=7.8, 8.0 MeV; Ge(Li), NaI(Tl) detectors; Measured $\sigma(\theta(\gamma))$, Doppler-shift attenuation. ^{26}Al levels deduced J, mean lifetime.1972Du05: $^{23}\text{Na}(\alpha, n\gamma)$, E=4.6–7.5 MeV; Ge(Li)–NaI(Tl) in anti-Compton and pair spectrometer mode; Measured E_γ , I_γ , deduced ^{26}Al levels, mean lifetime using Doppler Shift Attenuation Method.1974Be08: $^{23}\text{Na}(\alpha, n\gamma)$, E=6.0–7.0 MeV. Target: NaCl (thickness 50 $\mu\text{g}/\text{cm}^2$) Ge Measured recoil distance, Doppler shift. Natural targets. Deduced mean lifetime of excited states. **^{26}Al Levels**

E(level) [†]	J π	T _{1/2} [§]	Comments
0.0	5+		J π : From Adopted Levels.
228.305 13			
416.852 3			
1057.739 12		<24 fs	
1759.034 8		2.3 ps 6	T _{1/2} : From mean lifetimes 2.75 ps 20 and 3.9 ps 2 (1972Du05). Others: 4.44 ps 28 (1974Be08), 3.95 ps 76 (1972Ma67), 4.37 ps 35 (1974Be43).
1850.62 3			
2068.86 5		260 fs 42	T _{1/2} : Other: 0.69 ps 7 (1974Be08).
2069.47 3			
2071.64 4		319 fs 28	
2365.150 18		1.39 ps 14	
2545.367 17		0.87 ps 14	
2660.92 5			
2740.03 3			
2913.40 5		<28 fs	
3402.65 6	5+ [‡]	51 fs [#] 13	
3507.63 8	6+ [‡]	<21 fs [#]	
3921.96 24	7+, (5+)		J π : From 1974Pr08, based on γ -ray angular distribution coefficients and polarization measurements.

[†] From Adopted Levels.[‡] From 1971Sh19, based on γ -ray angular distribution and mean lifetime measurements.[§] From mean lifetime in 1972Du05, except otherwise noted.[#] From mean lifetime in 1971Sh19. Uncertainty: Statistical only. **$\gamma(^{26}\text{Al})$**

E(level)	E γ	I γ	Comments
3921.96	3921.64	100	A ₂ =0.41 2; A ₄ =-0.13 2 (1974Pr08). polarization 0.77 34 (1974Pr08).

 $^{24}\text{Mg}(^3\text{He}, p\gamma)$ 1973Go10J $\pi(^{24}\text{Mg})=0+$.Others: 1972Be51, 1972Ma67, 1972No04, 1976De24, 1973Ol04, 1968Bi05, 1968Da11, 1969Bi04. 1981Ta04: ($^3\text{He}, p$). $^{24}\text{Mg}(^3\text{He}, p\gamma)$, E=6 MeV. Doppler-shift attenuation. **^{26}Al Levels**

E(level)	T _{1/2}	L	E(level)	T _{1/2}	L	E(level)	T _{1/2}	L
0.0		4	2071.64 4	270 fs 35	0+2	3596.34 4	30 fs 5	2
228.305 13		0	2365.150 18	0.66 ps 17	2+4	3680.68 6	19 fs 8	
416.852 3		2(+4)	2545.367 17	0.6 ps 3	2	3723.81 4	<16 fs	0
1057.739 12	28 fs 7	0+2	2660.92 5	3 ps 3	(2)	3750.90 4	30 fs 6	
1759.034 8	1.7 ps 5	2	2740.03 3	37 fs 6	2	3753.63 13	19 fs 8	0
1850.62 3	30 fs 8	0+2	2913.40 5	59 fs 10	2	3962.83 5	47 fs 10	(2)
2068.86 5	364 fs 20	0+2	3073.63 4	201 fs 50	4	4349.34 7		2
2069.47 3	21 fs 10	0+2	3159.889 13	25 fs 7	2	4430.72 6		4

$^{24}\text{Mg}(^3\text{He},\text{p}\gamma)$ 1973Go10 (continued) $\gamma(^{26}\text{Al})$

E_γ		E(level)
829.3 [†]	4	1057.739
1621.7 [†]	9	1850.62
1842.6 [†]	7	2071.64

[†] From 1968Bi05. **$^{24}\text{Mg}(\alpha,\text{d})$ 1993Ya14,1991Ya02**

Other: 1991Ya02, 1976De24, 1973Ol04.

1993Ya14: 99.92% enriched target (thickness 0.46 mg/cm²); Projectile: α , E=63.7 MeV; magnetic spectrometer and a single-wire position-sensitive detector; FWHM 40 keV; Proposed new 6- and 5- states. DWBA calculations.1991Ya02: 99.92% enriched target (thickness 0.46 mg/cm²); Projectile: α , E=64.7 MeV; magnetic spectrometer and a single-wire position-sensitive detector; populated gs and 230 keV states of ^{26}Al . ^{26}Al Levels

E(level) [†]	J π #	L@	Comments
0.0 [‡]		4	
228.305 [‡]	13		
416.852 [§]	3	2	
1850.62 [§]	3	0	
3073.63 [§]	4	4	
6080	10	(5-)	T=0.
6880	10		
7520	10		
7550	10		
8010	10		
8060	10		
9260	10		
9960	10	5-	T=0.
10660	10	6-	T=0.
11970	10		
12400	20		
12550	20		
13250	20		
13910	20	6-	T=0.
14050	20		

[†] From 1993Ya14, except otherwise noted.[‡] Reported in 1991Ya02. Excitation energy quoted from Adopted Levels.[§] From Adopted Levels.

Proposed in 1993Ya14, based on angular distribution measurements and DWBA calculations.

@ From 1973Ol04. Also in 1976De24.

 $^{25}\text{Mg}(\text{p},\gamma),(\text{p},\text{p})$ 1988En01,1996Br06,1984Ad07

Others: 2010Li22,2008Fo04,2006Ar12,2003Fe11,1998Po20,1990Il01,1988Bo37, 1986En03,1986En04,1985Be17, 1983Ke05,1982De15,1982Ke08,1980Ni10, 1968Ha42,1976Ak01,1974De37.

J $\pi(^{25}\text{Mg})=5/2+$.1988En01: $^{25}\text{Mg}(\text{p},\gamma)$, E=0.31–1.84 MeV; four Ge detectors; Measured E_γ , I_γ . Enriched targets, Ge detectors.1996Br06: $^{25}\text{Mg}(\text{p},\gamma)$ – 86% enriched ^{25}Mg target (thickness 20 $\mu\text{g}/\text{cm}^2$) on gold backing, proton beam, E=2–4 MeV, 1.103–, 1.164–, 1.342–MeV; NaI(Tl) detector; Measured E_γ , I_γ , γ yield, $\Gamma(\theta)$, anisotropies, resonance strengths.Deduced levels, J, π , t, δ . Thicker target (50 $\mu\text{g}/\text{cm}^2$) was used for thick-target yield of resonances.1984Ad07: $^{25}\text{Mg}(\text{p},\text{p})$ Target: 99.7% enriched ^{25}Mg target (thickness 0.6–2.0 $\mu\text{g}/\text{cm}^2$) evaporated onto 5 $\mu\text{g}/\text{cm}^2$ carbon foils; Projectile: proton, E=0.70–2.18 MeV, scattered protons were detected by Si surface-barrier at laboratory angles of 90°, 105°, 135°, and 160°; Measured E_p , differential cross sections, deduced L values, spin and parity, Γ_p , spectroscopic factors.

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$^{25}\text{Mg}(\text{p},\gamma),(\text{p},\text{p})$ 1988En01,1996Br06,1984Ad07 (continued)

1986En04: $^{25}\text{Mg}(\text{p},\gamma),(\text{p},\text{p})$ – 98.25% enriched ^{25}Mg target (thickness 5–10 $\mu\text{g}/\text{cm}^2$) evaporated onto 0.3 mm thick Na-free Ta backings; $E_{\text{p}}=0.031\text{--}1.84$ MeV; deduced excited levels, resonance strengths, partial widths. Also studied (p, γ) reaction, Ge detector.

 ^{26}Al Levels

$E(\text{level})^\dagger$	$J\pi^\S$	$T_{1/2}^{\text{a}}$	$L^\S$	S^e	Comments
0.0					
228.305 13					
416.852 3					
1057.739 12					
1759.034 8		>1.5 ps ^b			
1850.62 7					$T_{1/2}$: 11 fs 5 (1968Ha42), 28 fs 7 (1974De37), 32.6 fs 35 (1983Ke05).
2068.86 5					$T_{1/2}$: 263 fs 90 (1968Ha42), 347 fs 120 (1974De37).
2069.47 3					$T_{1/2}$: 9 fs 4 (1968Ha42), 13 fs 4 (1974De37), 15 fs 2 (1982Ke08).
2071.64 4					$T_{1/2}$: 390 fs 190 (1968Ha42), 370 fs 140 (1974De37), 510 fs 70 (1983Ke05).
2365.150 18		>0.830 ps ^b			
2545.367 17		0.6 ps ^b 3			
2660.92 5		>0.900 ps ^b			
2740.03 3		28 fs ^c 5			$T_{1/2}$: Other: 26 fs 9 (1974De37).
2913.40 5		70 fs ^c 5			$T_{1/2}$: Other: 63 fs 12 (1974De37).
3073.63 4		215 fs ^c 30			$T_{1/2}$: Other: 104 fs 40 (1974De37).
3159.889 13		5.5 fs ^c 21			$T_{1/2}$: Others: 10 fs<(1974De37), 6.2 fs 14 (1982Ke08).
3402.65 6		76 fs ^c 10			
3507.63 8		18 fs ^c 6			
3596.34 4		17 fs ^c 3			$T_{1/2}$: Other: 21 fs 9 (1974De37).
3674.92 5		150 fs ^c 20			$T_{1/2}$: Other: 180 fs 50 (1974De37).
3680.68 6		8 fs ^c 1			$T_{1/2}$: Other: <17 fs (1974De37).
3723.79 5		4.2 fs ^c 14			$T_{1/2}$: Other: <17 fs (1974De37).
3750.90 4		15 fs ^b 6			$T_{1/2}$: Other: 26 fs 11 (1983Ke05).
3753.63 13		22 fs ^b 11			$T_{1/2}$: Other: 5 fs 2 (1983Ke05).
3921.96 24					
3962.83 5		37 fs ^c 8			$T_{1/2}$: Other: 28 fs 9 (1974De37).
3977.91 9		>1.0 ps			
4191.92 6		4.9 fs ^c 21			
4205.86 5		62 fs ^c 10			
4349.34 7		9 fs ^c 3			$T_{1/2}$: Other: <10 fs (1974De37).
4430.72 6		59 fs 13			
4480.48 9		55 fs ^c 14			$T_{1/2}$: Other: 76 fs 21 (1974De37).
4547.92 6		<10 fs ^b			
4599.17 5		4.9 fs ^c 21			
4622.38 5		53 fs ^c 18			
4705.37 4		<3.5 fs ^c			$T_{1/2}$: Other: 10 fs<(1974De37).
4773.35 6		82 fs ^c 12			
4939.64 9		64 fs ^c 19			$T_{1/2}$: Other: 76 fs 21 (1974De37).
4940.79 5		24 fs 6			
4952.30 4		10 fs ^c 3			
5006.66 16		121 fs 30			
5010.24 7		<6.2 fs			
5131.93 5		<3.5 fs			
5141.68 6		<4.2 fs			
5195.11 12		<24 fs			
5245.28 4		12 fs ^c 3			
5395.53 7		66 fs ^c 50			
5431.23 10		12 fs 6			
5456.71 5		17 fs 4			
5461.87 13		<21 fs			
5487.93 6		17 fs 6			
5494.51 5		<4.9 fs			
5513.48 4		35 fs ^c 4			
5544.56 7		15 fs ^c 13			
5569.16 19					
5584.99 6					

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$^{25}\text{Mg}(\text{p},\gamma),(\text{p},\text{p})$ 1988En01,1996Br06,1984Ad07 (continued) **^{26}Al Levels (continued)**

$E(\text{level})^\dagger$	$J\pi^\S$	$T_{1/2}^a$	$L^\S$	S^e	Comments
5598.30 6		19 fs 7			
5671.04 7		<28 fs			
5676.07 5		22 fs ^c 10			
5692.15 5		2.8 fs 11			
5726.38 5		<4.9 fs			
5849.21 8		10 fs 6			
5882.65 9		<12 fs			
5916.10 6		<2.1 fs ^c			
5924.19 7		<12 fs			
5949.94 8		<30 fs			
6028.02 4		<4 fs			
6084.07 5		90 fs 20			
6086.47 11		14 fs 11			
6120.01 7	6+&	10 fs 3			
6197.56 19	1(-)&				
6238.4 3		<7 fs			
6254.06 20					
6270.19 11		<9 fs			
6280.33 9		<14 fs			
6343.46 8	4(+)&	<6 fs			
6363.99 8		22 fs 11			
6398.64 21					Measured resonance strength $\omega\gamma=2.9\times 10^{-10}$ eV 6 (2012St02); $\omega\gamma<2\times 10^{-8}$ eV (2006Ar12).
6414.46 10					
6436.44 11	5+&	<17 fs			
6495.94 7	5+&	<8 fs		8.9×10^{-6f} 12	$E_p=197.6$ keV 5. $\omega\gamma=1.1\times 10^{-7}$ eV 2 (2006Ar12).
6550.68 7				6.1×10^{-5f} 7	$E_p=254.2$ keV 5.
6598.32 16				6.1×10^{-4f} 7	$E_p=304.1$ keV 5. Measured resonance strength $\omega\gamma=30.7$ meV 17 (2010Li22).
6610.40 6		<0.04 keV ^d		0.43 5	$E_p=316.7$ keV 5. Γ from 1985Be17. Resonance strength $\omega\gamma=30.7$ meV 17 (2010Li22); $\omega\gamma=21$ meV 2 (2006Ar12).
6680.45 7		0.0012 keV 3		0.88 8	$E_p=389.6$ keV 5. Γ from 1986En04. $\omega\gamma=40$ meV 4 (2006Ar12).
6695 1					$E(\text{level})$: from 1996Br06. Populated by deexcitation of 9720 level (7+).
6724.25 7		<0.04 keV ^d		1.57 19	$E_p=435.1$ keV 5. Γ from 1985Be17. $\omega\gamma=71$ meV 2 (2006Ar12).
6783.79 5		<0.05 keV ^d		1.04 15	$E_p=497.0$ keV 5. Γ from 1985Be17.
6789.30 4				0.86 11	$E_p=502.8$ keV 5.
6801.12 4		0.41 eV 20		0.58 9	$E_p=515.1$ keV 5. Γ from 1986En04.
6801.60 16		0.34 eV 6		0.23 9	$E_p=515.6$ keV 5. Γ from 1986En04.
6815.74 10				< 4×10^{-4}	
6817.86 9		0.7 eV 3		0.25 2	$E_p=532.5$ keV 5. Γ from 1986En04.
6851.50 11				3.8 4	$E_p=567.4$ keV 5.
6874.29 8		0.43 eV 23		0.14 6	$E_p=591.2$ keV 5. Γ from 1986En04.
6875.73 6				2.60 20	$E_p=592.7$ keV 5.
6891.70 4				0.017 7	$E_p=609.3$ keV 5.
6936.20 8				0.39 4	$E_p=655.6$ keV 5.
6964.48 9				5.6 8	$E_p=685.0$ keV 5.
7000.91 9				2.2 2	$E_p=722.9$ keV 5.
7015.01 11		0.18 eV 5		0.37 5	$E_p=737.6$ keV 5. Γ from 1986En04.

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$^{25}\text{Mg}(\text{p},\gamma),(\text{p},\text{p})$ 1988En01,1996Br06,1984Ad07 (continued) **^{26}Al Levels (continued)**

E(level) [†]	$J\pi^{\S}$	$T_{1/2}^{\text{a}}$	$L^{\S}$	S^{e}	Comments
7051.22 7		0.95 eV 11		1.60 13	$E_{\text{p}}=775.2$ keV 5. Γ from 1986En04.
7085.97 16				1.7 3	$E_{\text{p}}=811.4$ keV 5.
7092.78 9		0.68 eV 12		0.19 2	$E_{\text{p}}=818.5$ keV 5.
7108.71 8	(1 to 4)−	0.084 keV 20	1	0.52 4	$E_{\text{p}}=835.1$ keV 5.
7141.80 5	(1 to 3)−	0.28 keV 5	1	0.69 7	$E_{\text{p}}=869.5$ keV 5.
7152.84 6	(2,3)+	0.550 keV 25	0	3.9 4	$E_{\text{p}}=881.0$ keV 5.
7160.97 9	(1 to 4)−	0.180 keV 25	1	0.60 5	$E_{\text{p}}=889.5$ keV 5.
7167.65 6	(1 to 3)−	0.175 keV 20	1	0.54 5	$E_{\text{p}}=896.4$ keV 5.
7198.44 12				4.0 4	$E_{\text{p}}=928.4$ keV 5.
7222.42 9				7.6 7	$E_{\text{p}}=953.4$ keV 5.
7237.68 5	(1 to 4)−	0.170 keV 25	1	0.75 11	$E_{\text{p}}=969.3$ keV 5.
7253.6 2	2−	4.9 keV 5	1	8.7 11	$E_{\text{p}}=985.8$ keV 5.
7285.62 11				0.041 15	$E_{\text{p}}=1019.1$ keV 5.
7291.33 9	(2 to 5)+	0.305 keV 15	2	3.1 3	$E_{\text{p}}=1025.1$ keV 5.
7308.22 5				8.3 7	$E_{\text{p}}=1042.7$ keV 5.
7347.89 10	(3,4)−	1.8 keV 2	1	5.7 6	$E_{\text{p}}=1083.9$ keV 5.
7366.25 11				2.8 3	$E_{\text{p}}=1103.0$ keV 5.
7396.92 5	(2,3)+	0.555 keV 11	0	1.25 12	$E_{\text{p}}=1134.9$ keV 5.
7398.70 10	3−	2.36 keV 3	1	5.6 6	$E_{\text{p}}=1136.8$ keV 5.
7409.62 8	(2 to 4)−	0.62 keV 6	1	4.4 7	$E_{\text{p}}=1148.1$ keV 5.
7425.07 7	(1 to 4)−	0.345 keV 15	2	2.4 3	$E_{\text{p}}=1164.2$ keV 5.
7439.50 14				0.05 2	$E_{\text{p}}=1179.2$ keV 5.
7444.16 16	(1 to 4)−	0.555 keV 10	1	0.39 3	$E_{\text{p}}=1184.1$ keV 5.
7455.34 19				4.5 4	$E_{\text{p}}=1195.7$ keV 5.
7464.44 11				5.3 7	$E_{\text{p}}=1205.2$ keV 5.
7495.38 4	3+	1.48 keV 2	0	8.3 11	$E_{\text{p}}=1237.3$ keV 5.
7497 2	2−	0.75 keV 20	1	1.7 3	$E_{\text{p}}=1239$ keV 2.
7529.26 5				0.10 4	$E_{\text{p}}=1272.6$ keV 5.
7539.52 11	2−	3.3 keV 3	1	3.7 10	$E_{\text{p}}=1283.3$ keV 5.
7548.20 9				0.21 5	$E_{\text{p}}=1292.3$ keV 5.
7557.56 25	2+	0.91 keV 4	0	4.3 8	$E_{\text{p}}=1302.1$ keV 6.
7561.2 2	2+	5.0 keV 5	0	13 2	$E_{\text{p}}=1305.8$ keV 5.
7591.55 10	(0 to 5)+	0.017 keV 4	2	1.0 3	$E_{\text{p}}=1337.1$ keV 5.
7596.06 12				2.9 3	$E_{\text{p}}=1342.1$ keV 5.
7604.80 10	2,(3)−	0.62 keV 8	1	1.2 2	$E_{\text{p}}=1351.2$ keV 5.
7622.68 10				1.4 3	$E_{\text{p}}=1369.8$ keV 5.
7627.52 12	(0 to 5)+	0.900 keV 3	2	14.9 12	$E_{\text{p}}=1374.8$ keV 5.
7647.8 4		0.023 keV 14		0.012 3	$E_{\text{p}}=1395.9$ keV 6. Γ from 1986En04.
7761.84 10	3−	1.57 keV 2	1	1.2 4	$E_{\text{p}}=1514.6$ keV 5.
7772.25 6				2.9 4	$E_{\text{p}}=1525.4$ keV 5.
7773 2	1−	5.3 keV 8	1	0.07 2	$E_{\text{p}}=1526$ keV 2.
7813.63 18	1+	2.7 keV 3	2	1.2 3	$E_{\text{p}}=1568.4$ keV 5. Γ from 1986En04.
7824.66 15	4,(3)−	0.99 keV 14	1	1.1 3	$E_{\text{p}}=1579.9$ keV 5.
7831.61 7	(2 to 5)+	0.85 keV 3	2	8.2 10	$E_{\text{p}}=1587.2$ keV 5.
7865.0 3	2+	6.6 keV 10	0	3.7 12	$E_{\text{p}}=1621.9$ keV 6.
7874.29 15	3+	1.9 keV 2	0	7.2 6	$E_{\text{p}}=1631.6$ keV 5.
7879.6 3		3.7 keV 4		1.2 2	$E_{\text{p}}=1637.1$ keV 6. Γ from 1986En04.
7891.17 9	4+	4.50 keV 14	2	35 3	$E_{\text{p}}=1649.1$ keV 5.
7921.27 14				0.4 2	$E_{\text{p}}=1680.4$ keV 5.
7938.79 8	3+	4.6 keV 3	0	25 3	$E_{\text{p}}=1698.7$ keV 5.
7953.35 6	(4,5)+	6.82 keV 5	2	38 5	$E_{\text{p}}=1713.8$ keV 5.
7982 2	2+	12 keV 2	0	14.8 15	$E_{\text{p}}=1744$ keV 2.
8000.63 7	1−	0.71 keV 15	1	1.1 2	$E_{\text{p}}=1763.0$ keV 5. Γ from 1986En04.
8008.08 9	2+	0.76 keV 13	0	2.3 4	$E_{\text{p}}=1770.8$ keV 5.
8011.18 6	5,(3,4)−	0.14 keV 4	3	2.4 8	$E_{\text{p}}=1773.9$ keV 5.
8035.7 3				0.18 3	$E_{\text{p}}=1799.5$ keV 6.
8046.64 10	3−	1.9 keV 3	1	0.9 2	$E_{\text{p}}=1810.9$ keV 5.
8064 2	2+	7.3 keV 11	0	7.6 15	$E_{\text{p}}=1829$ keV 2.

Continued on next page (footnotes at end of table)

²⁵Mg(p,γ),(p,p) 1988En01,1996Br06,1984Ad07 (continued)

²⁶Al Levels (continued)

E(level) [†]	Jπ [§]	T _{1/2} ^a	L [§]	S ^e	Comments
8066 2					E _p =1831 keV 2.
8067.44 9	(5,6)−	0.20 keV 5	3	2.3 7	E _p =1832.5 keV 5.
8116 2	3+	5.9 keV 9	0		E _p =1883 keV 2.
8130 2	1,(2)−	1.2 keV 2	3		E _p =1898 keV 2.
8131 2	3−	2.7 keV 4	1		E _p =1899 keV 2.
8164 2	1−	10.5 keV 16	1		E _p =1933 keV 2.
8174 2	3+	23 keV 3	0		E _p =1943 keV 2.
8186 2	4,(5)+	0.26 keV 7	2		E _p =1956 keV 2.
8227 2	4+	0.61 keV 9	2		E _p =1998 keV 2.
8249 2	2−	11 keV 2	1		E _p =2021 keV 2.
8256 2	4−	0.25 keV 6	3		E _p =2029 keV 2.
8261 2	3−	9.6 keV 14	1		E _p =2034 keV 2.
8272 2	2−	8.2 keV 12	1		E _p =2045 keV 2.
8294 2	3+	25 keV 4	0		E _p =2068 keV 2.
8310 2	2−	1.5 keV 2	1		E _p =2085 keV 2.
8347 2	3−	40 keV 6	0		E _p =2123 keV 2.
8531 [‡] 1	4 [#]			1.8 [‡] 4	E _p =2313 keV 1 (1996Br06).
8602 [‡] 1	(5,6)+ [@]			1.9 [‡] 4	E _p =2387 keV 1 (1996Br06).
8747 [‡] 1	6+ [@]			4.4 [‡] 9	E _p =2538 keV 1 (1996Br06).
8924 [‡] 1	4 [#]			19 [‡] 4	E _p =2722 keV 1 (1996Br06).
9060 [‡] 1	4 [#]			6.1 [‡] 12	E _p =2864 keV 1 (1996Br06).
9271 [‡] 1	6−,4 [@]				E _p =3083 keV 1 (1996Br06).
					E(level),Jπ: Doublet with Jπ=6− and 4 components (1996Br06).
					E _p =3083 keV 1 (doublet) (1996Br06).
9286 [‡] 1	5 [@]			7.8 [‡] 16	E _p =3099 keV 1 (1996Br06).
9311 [‡] 1	(3+,4) [#]			6.4 [‡] 3	E _p =3125 keV 1 (1996Br06).
9720 [‡] 1	7+,(3,4) [@]				E(level),Jπ: Doublet with Jπ=7+ and (3,4) components. 7+ component populates 6695 keV level.
					E _p =3550 keV 1 (doublet) (1996Br06).
9986 [‡] 1	7+ [@]			8.6 [‡] 17	E _p =3827 keV 1 (1996Br06).

[†] From 1988En01. Listed E_p values are from 1986En04 and 1984Ad07 (Also in Table 26.17 – 1990En08), except otherwise noted.

[‡] From 1996Br06.

[§] From (p,p) (1984Ad07), except noted otherwise, based on cross section measurements and analyses.

[#] From 1996Br06, based on I_γ(0°)/I(75°) measurements.

[@] From 1996Br06, based on σ_p(θ) measurements.

[&] From 1996Br06, based on γ-ray angular distribution measurements, feeding, and other studies in the literature.

^a Half-life or Γ. Half-life from 1988En01 and Γ from 1984Ad07, except otherwise noted. Listed Γ from 1984Ad07 is Γ_p+Γ_γ.

^b From 1974De37.

^c From 1983Ke05.

^d For these levels Γ₀/Γ=1 is probable on the basis of strength statistics.

^e From 1986En04, except otherwise noted.

^f From 1990Il01.

γ(²⁶Al)

E(level)	Eγ [†]	Iγ [‡]	E(level)	Eγ [†]	Iγ [‡]	E(level)	Eγ [†]	Iγ [‡]
416.852	416.848	100.0	2071.64	221.02	0.045 11	2660.92	589.27	5.6 13
1057.739	829.3 4	100.0		1654.73	11.9 10		591.44	41.0 16
1759.034	701.285	2.04 10		1842.8 7	100.0 10		810.29	2.5 3
	1342.145	100.00 10	2365.150	295.678	100.0 20		901.87	1.02 8
1850.62	1433.73	0.70 10		606.108	2.90 10		1603.13	14.8 5
	1622.0 7	100.00 10		1307.375	26.9 8		2243.96	100 3
2068.86	1651.95	100.0 15		1948.219	64.7 20	2740.03	2323.07	0.81 20
	2068.77	44.9 15		2365.034	1.75 8		2511.59	100.00 20
2069.47	218.85	0.053 13	2545.367	475.892	100.0 15	2913.40	843.92	100.0 13
	310.43	0.23 3		786.320	4.9 3		1062.76	1.55 6
	1011.71	100.0 12		1487.582	3.7 3		1154.34	1.17 6
	1652.56	28.4 11		2128.421	38.2 15		1855.59	1.17 6
	1841.09	4.0 5		2545.232	0.31 9		2496.42	43.7 13

Continued on next page (footnotes at end of table)

$^{25}\text{Mg}(\text{p},\gamma),(\text{p},\text{p})$ 1988En01,1996Br06,1984Ad07 (continued) $\gamma(^{26}\text{Al})$ (continued)

E(level)	$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\ddagger}$	E(level)	$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\ddagger}$	E(level)	$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\ddagger}$
3073.63	1004.14	100.0 6	3962.83	3962.50	7.9 4	4622.38	1462.45	3.4 6
	1222.98	3.23 10	3977.91	1906.19	1.5 3		1548.70	14.1 13
	1314.56	0.44 5		2127.20	100.0 16		1882.28	100 3
	2015.81	14.7 5		2919.99	59.7 16		1961.38	60.0 16
	2656.63	0.60 24	4191.92	595.57	1.50 12		2076.92	6.6 19
	3073.43	0.95 11		1278.49	0.66 7		2257.12	3.8 9
3159.889	614.514	2.24 8		1530.95	0.9 3		2552.77	57.2 25
	794.726	0.35 8		1646.50	3.57 17		2771.60	28.4 22
	1088.224	4.25 13		1826.70	15.8 9		3564.38	4.7 9
	1309.233	0.55 5		2122.97	40.6 12		4205.16	35.9 25
	1400.814	23.1 6		2432.76	6.6 3	4705.37	1024.67	0.9 4
	2102.058	25.7 8		3774.77	100.0 15		1631.68	1.1 4
	2742.881	100.0 11		4191.56	0.41 10		2159.91	27.9 9
	2931.406	0.69 8	4205.86	530.93	0.061 15		2340.11	44.7 14
3402.65	1037.48	0.84 11		1132.20	0.79 5		2636.37	1.05 18
	1333.75	9.3 4		1292.43	0.95 8		4288.14	0.53 18
	2985.61	100.0 18		1544.89	12.3 8		4704.91	100.0 18
	3402.41	64.9 18		1660.44	4.8 3	4773.35	581.42	13.7 10
3507.63	1438.73	0.32 7		1840.64	10.3 8		1092.65	1.27 10
	3507.37	100.00 10		2136.91	16.1 11		1098.41	0.40 10
3596.34	1526.82	100.00 22		2446.70	1.67 11		1176.98	0.87 13
	1745.66	1.07 7		3788.71	100.0 15		1370.66	2.0 7
	2538.47	3.48 11		4205.49	4.4 3		1699.66	11.7 7
	3179.28	0.20 4	4349.34	2279.76	100.0 6		1859.88	19.3 7
	3596.07	4.02 22		2590.17	0.85 10		2112.34	87 3
3674.92	1129.53	3.5 4		3291.38	1.90 20		2227.88	18.0 7
	1309.73	14.2 7		3932.17	2.8 6		2408.08	27.0 10
	1606.01	1.75 18		4348.95	0.64 11		2704.34	10.0 10
	1915.81	48.0 14	4430.72	1270.80	5.7 5		3014.13	1.3 3
	3257.85	100.0 16		1885.28	1.6 5		4356.10	100 3
	3674.64	7.7 4		2065.48	3.0 10		4772.88	40.3 17
3680.68	520.79	0.28 4		2361.13	100 5	4939.64	1185.98	5.25 25
	767.27	0.13 5		2579.96	1.0 5		1779.69	1.3 4
	1611.16	100.00 21		2671.54	4.8 10		2199.51	0.6 4
	1829.99	0.19 4		3372.74	1.1 3		2278.61	1.0 3
	1921.57	1.23 6		4013.53	48 5		2867.83	7.1 15
	2622.80	2.79 21	4480.48	1740.39	37.0 14		2870.00	6.1 15
	3263.61	1.77 8		2408.72	100.0 23		3088.82	1.0 4
	3680.40	0.77 8		2629.72	77.3 23		3180.40	0.63 25
3723.79	1062.87	0.35 9		3422.50	11.8 11		3881.59	1.5 5
	2665.92	0.44 9	4547.92	867.22	0.48 6		4710.87	100.0 13
	3495.25	100.00 10		1634.46	1.00 8	4940.79	1265.84	0.56 19
3750.90	591.00	23.2 14		1807.82	1.48 10		1433.12	3.33 19
	837.49	0.57 10		1886.93	0.42 10		1867.09	0.46 15
	1385.71	0.19 10		2002.47	11.0 4		2395.30	39.8 15
	1681.37	100 3		2182.67	6.87 21		2575.50	38.1 11
	1900.20	0.39 10		2476.15	2.71 13		2871.76	1.3 4
	1991.78	0.28 9		2697.15	0.17 6		4523.51	100.0 19
	2693.01	13.9 4		2788.72	14.6 4		4940.28	2.0 4
	3333.82	9.0 12		3489.93	100.0 21	4952.30	760.37	2.3 4
3753.63	1013.58	2.2 3		4130.71	68.8 21		1792.34	100.0 18
	1681.93	11.0 3		4319.23	1.19 10		2038.81	1.58 18
	1902.93	3.0 4	4599.17	848.26	3.8 4		2212.17	1.75 18
	2695.74	100.0 5		918.47	1.66 10		2406.81	1.1 4
3921.96	3921.64	100.0		924.23	6.5 4		2882.66	44.0 14
3962.83	1222.77	0.7 3		1525.49	2.10 21		3101.48	4.6 4
	1301.88	2.1 10		1685.71	7.1 4		3894.25	3.3 4
	1597.63	4.9 4		1938.17	13.8 6		4535.02	16.5 5
	1893.29	100.0 14		2053.72	10.5 4	5006.66	2093.17	4.2 8
	2112.12	2.3 3		2233.92	5.45 21		2266.52	3.5 8
	2203.70	3.1 4		2530.18	5.45 21		2345.63	3.5 9
	2904.92	15.9 6		2839.97	100.0 19		2937.01	100 3
	3545.72	5.6 4		4181.95	53.0 17		3155.83	2.9 12

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$^{25}\text{Mg}(\text{p},\gamma),(\text{p},\text{p})$ 1988En01,1996Br06,1984Ad07 (continued) $\gamma(^{26}\text{Al})$ (continued)

E(level)	$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\ddagger}$	E(level)	$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\ddagger}$	E(level)	$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\ddagger}$
5006.66	3247.41	10.8 15	5395.53	5394.93	71.7 22	5544.56	3179.20	48 3
	3948.60	29.2 15	5431.23	883.29	2.33 21		3472.67	8.6 14
5010.24	1256.58	2.4 8		950.73	0.82 21		3693.66	3.2 11
	4781.46	100.0 8		1677.54	79 9		3785.23	40.7 25
5131.93	782.58	0.72 7		2770.15	1.5 3		4486.40	10.0 18
	926.05	1.17 5		3359.36	36 15		5127.16	100 7
	939.99	0.200 20		3361.53	100 15		5315.67	5.7 14
	1169.07	4.5 13		3580.34	18.8 6	5569.16	863.77	23 7
	1451.21	1.01 15		3671.92	2.4 3		3500.05	39 11
	1456.97	0.27 5		4373.09	82 6		5568.52	100 13
	1535.54	9.20 20		5202.36	55.8 18	5584.99	1037.05	7.2 4
	1729.22	11.2 5	5456.71	751.33	1.1 3		1831.29	2.8 4
	1971.96	0.61 7		908.77	15.3 8		2424.98	1.2 4
	2058.21	42.8 13		1705.75	1.4 6		2671.44	3.0 4
	2586.42	2.17 16		1775.96	1.4 6		3825.65	1.6 5
	2766.62	100.0 20		1781.72	1.4 6		5356.09	100.0 8
	3062.27	11.4 22		1860.30	1.1 3	5598.30	2438.29	100 8
	3062.88	35.9 22		2296.71	14.4 8		3528.57	78 8
	3372.66	0.110 20		2382.96	15.6 8		5180.89	73 8
	4714.62	1.40 20		2795.63	53.3 25	5671.04	1917.33	100 4
	5131.38	0.94 7		2911.17	3.3 6		1990.28	6.5 16
5141.68	1178.82	1.6 3		3091.36	6.1 6		2511.02	46.9 20
	1545.29	1.7 4		3387.00	27.5 11		4612.86	15.9 24
	2776.37	0.86 12		3697.39	18.3 8		5253.61	11.8 18
	3069.84	1.0 4		5039.33	100 8		5442.12	22 4
	3382.41	14.8 12	5461.87	2301.87	26 9	5676.07	1076.88	3.56 18
	4083.59	3.6 5		2548.34	87 17		1484.10	15.6 4
	4724.36	100.0 25		2721.69	74 13		1995.31	3.02 18
5195.11	1471.25	35.7 24		2800.79	35 9		2001.07	0.49 18
	3123.27	100 7		3610.98	35 13		3130.50	7.78 22
	3344.26	21.4 24		3702.55	100 13		3310.69	1.76 18
	4137.02	81 7		4403.73	78 13		3606.94	0.84 16
5245.28	539.90	5.9 4	5487.93	2085.19	5.3 19		5258.64	100.0 22
	895.92	0.70 9		2414.18	100 5		5675.40	88.9 22
	1039.40	0.93 11		3122.58	14 3	5692.15	550.46	0.52 16
	1053.34	100.0 22		3418.83	22 3		1092.96	0.55 18
	1282.42	3.91 22		5487.30	16 3		1144.20	0.48 20
	1494.33	0.17 7	5494.51	946.57	2.42 22		1486.24	0.95 18
	1564.55	0.93 9		1898.09	3.1 10		1500.18	41.6 14
	1570.31	0.41 11		2334.51	4.7 6		2011.39	4.1 3
	1648.88	4.6 11		3424.80	100.0 11		2095.72	0.66 14
	1737.59	0.54 9	5513.48	381.55	0.70 14		2532.13	37.5 11
	1842.56	3.3 11		808.10	1.62 16		2618.38	1.57 20
	2171.55	11.3 4		1164.11	3.11 19		3031.04	0.70 20
	2331.77	12.2 4		1321.52	100 3		3622.41	0.70 18
	2584.22	6.30 20		1762.52	0.78 19		3932.79	37.3 11
	2699.76	5.4 4		1917.06	1.1 3		5274.72	100.0 23
	2879.96	19.8 7		2599.94	2.89 22	5726.38	1377.00	2.2 3
	3175.60	8.3 4		2852.39	1.97 22		1763.49	16.5 8
	3485.99	16.1 7		2967.93	1.97 24		2051.37	1.9 3
	4827.94	8.5 4		3148.12	16.5 5		2129.95	6.5 5
	5244.71	7.8 4		3444.37	11.6 5		2323.62	22 3
5395.53	773.14	0.85 11		3754.15	71.9 22		3361.00	13.5 5
	796.35	4.13 22		5096.09	25.7 11		3657.24	16.2 8
	1203.58	13.3 4		5512.85	30.3 11		5308.94	89 3
	1720.55	0.33 9	5544.56	1581.68	6.4 11		5725.70	100 3
	1799.12	6.52 22		1793.59	71 4	5849.21	707.52	6.5 13
	1992.80	0.24 11		1820.68	4.3 14		1301.25	17.5 19
	2321.79	4.13 22		1948.14	18 4		1657.23	31 4
	2849.99	2.83 22		2470.80	7.1 14		2935.63	15 6
	3030.19	7.83 22		2631.02	16 3		3108.98	6.7 19
	3326.44	4.57 22		2883.47	7.9 14		3779.44	100 6
	4978.16	100.0 22		2999.01	8.6 18		4089.83	15 4

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$^{25}\text{Mg}(\text{p},\gamma),(\text{p},\text{p})$ 1988En01,1996Br06,1984Ad07 (continued) $\gamma(^{26}\text{Al})$ (continued)

E(level)	$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\ddagger}$	E(level)	$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\ddagger}$	E(level)	$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\ddagger}$
5849.21	5431.75	17 4	6084.07	2576.30	13.9 5	6363.99	3998.51	30 7
5882.65	740.96	5.3 23		4014.87	100 4		4294.75	30 7
	750.71	5.1 23		6083.30	27.0 9		4604.52	100 11
	1177.25	5.3 19	6086.47	4016.67	66 21		5946.40	44 7
	1260.24	7.2 16		4235.48	62 21	6414.46	4563.41	100 17
	1283.45	5.3 12		4327.05	34 10		5356.13	67 17
	1334.69	100 5		5857.45	100 21	6436.44	1304.47	100 10
	1690.67	4.0 16	6120.01	2444.97	9.0 12		1731.01	90 8
	2722.61	21.6 16		2717.21	38.2 15		4367.18	18 5
	2808.86	2.3 9		4050.81	100.0 15		6018.84	49 8
	3812.88	27.0 16	6197.56	5968.51	100.0	6495.94	769.5	11.5# 23
	4031.69	9.5 14	6238.4	1096.7	27.9 25		1790.5	20.9# 21
	4123.26	7 3		1690.4	36.4 25		3093.1	45# 4
	5465.18	32.6 23		1807.6	4.6 14		3422.0	15.8# 21
5916.10	774.41	2.7 5		2260.4	25 7		3950.2	2.9# 10
	1724.12	14.5 9		2484.6	18.2 25		4130.4	3.1# 10
	2165.10	5 3		2514.5	1.8 11		6078.2	100# 4
	2756.05	7.5 9		3078.3	4.6 18		6494.9	6.2# 21
	3002.51	4.3 9		3324.8	4.3 14	6610.40	694.5	0.28§ 6
	3550.69	3.6 9		3498.1	14 7		884.5	0.31§ 3
	3846.32	48.6 16		4168.6	100 4		1153.5	
	4065.14	10.7 25		4387.4	6.4 21		1214.5	0.69§ 6
	4156.71	15.0 11		4478.9	8.2 21		1670.4	0.25§ 3
	4857.87	14 5		5180.1	50 4		1988.4	0.88§ 22
	5498.62	100 5		6009.3	54 4		2011.4	0.38§ 3
5924.19	2243.41	40 6	6270.19	1075.06	9 3		2062.4	4.09§ 22
	2521.41	7.3 13		3110.10	22 3		2261.4	0.09§ 3
	3378.59	100 6		6041.13	100 5		2404.4	0.79§ 6
	3855.02	23 4	6280.33	1138.62	37 17		2418.4	60.1§ 9
	5923.46	38 4		1148.37	29 14		2647.4	0.53§ 3
5949.94	2196.20	47 6		1681.10	29 11		2860.3	2.89§ 6
	2789.88	100 9		2088.32	66 11		2929.3	3.43§ 9
	3880.15	50 9		3120.24	100 23		2935.3	2.7§ 4
	5720.95	32 6		4210.49	26 11		3014.3	13.49§ 22
6028.02	1021.34	2.5 5	6343.46	1211.50	14.6 15		3450.3	35.9§ 6
	1088.36	12.3 14		1638.03	8.3 22		3537.2	0.35§ 13
	2050.02	2.0 7		1744.23	100 4		3697.2	9.56§ 16
	2277.01	8.0 20		2151.44	30.4 22		3949.2	3.14§ 6
	2304.10	50.2 16		3269.61	11.1 24		4065.2	4.59§ 9
	3114.42	35.0 11		3797.79	28.3 22		4245.1	1.48§ 6
	3287.77	8.0 16		3977.98	8.3 11		4541.1	18.9§ 3
	3956.05	6.6 14		4274.22	18.9 11		4851.0	50.6§ 9
	4268.61	2.7 11	6363.99	2158.03	26 7		6192.7	100.0§ 16
	4969.77	100 5		2171.97	6 4		6609.6	0.18§ 1
6084.07	688.53	1.29 13		2612.95	23 3	6695	3187	
	1310.68	1.32 16		2683.16	48 4			
	1378.66	15.9 7		2688.92	44 15			
	2409.03	19.6 18		3818.32	19 7			

† From level energy difference with recoil-correction removed.

‡ From 1988En01, except otherwise noted.

§ From 2011Li22.

From 2012St02.

$^{25}\text{Mg}(^3\text{He},\text{d}),(\text{d},\text{n})$ 1968We04,1988Pe14,1996I101 $J\pi(^{25}\text{Mg})=5/2+$.

Other references: 1994Ve04,1989Ya13,1986Ch09,1978Be28,1972No04.

1968We04: $^{25}\text{Mg}(^3\text{He},\text{d})$ – Target: ^{25}Mg (thickness 250 $\mu\text{g}/\text{cm}^2$) with impurity<1%; $E(^3\text{He})=12$ MeV; Broad-range magnetic spectrograph; Measured deuteron spectra from 5° to 35° in 5° steps; FWHM 20 keV; Deduced L values, spectroscopic factors.1988Pe14: $^{25}\text{Mg}(^3\text{He},\text{d})$ – 97.9% enriched ^{25}Mg target; Projectile: ^3He , $E=55.20$ and 55.34 MeV; Reaction products were analyzed by a magnetic spectrometer; FWHM 38 keV and 55 keV at lower and higher excitations energies; Deduced excited level energies, $J\pi$, spectroscopic factors.1968Fu03: $^{25}\text{Mg}(\text{d},\text{n})$ – 99.2% enriched ^{25}Mg target; Projectile: Deuteron beam, $E=6$ MeV; neutrons were detected by NE213 liquid scintillators; Measured neutron Time-of-Flight (tof) spectrum; Deduced excited levels, spin and parity, L values, spectroscopic factors, DWBA analyses.1996I101: $^{25}\text{Mg}(^3\text{He},\text{d})$ – reanalyzed the experimental data of the literature. Deduced excited level energies, spin, parity, spectroscopic factors, etc. ^{26}Al Levels

$E(\text{level})^\dagger$	$J\pi^\S$	$L^\@$	$(2J+1)S^\@$	Comments
0.0	5+	2	8.7	$T=0$. (2J+1)S: Other: 6.2 ((d,n) – 1968Fu03).
228	0+	2	2.2	$T=1$. (2J+1)S: Other: 0.82 ((d,n) – 1968Fu03).
416	3+	0+2	3.4, 0.0	(2J+1)S: Other: 2.2, 2.4 ((d,n) – 1968Fu03).
1057	1+	2	3.6	$T=0$. (2J+1)S: Other: 2.8 ((d,n) – 1968Fu03).
1759	2+	0+2	1.1, 2.6	(2J+1)S: Other: 0.67, 1.4 ((d,n) – 1968Fu03).
1850	1+	2	0.58	(2J+1)S: 0.68 ((d,n) – 1968Fu03).
2068				
2069				
2071				
2365	3+	0+2	0.16, 1.8	(2J+1)S: Other: 0.12, 0.98 ((d,n) – 1968Fu03).
2545	$(2,3)+^\#$	0+2	0.20, 1.7	(2J+1)S: Other: 0.24, 1.6 ((d,n) – 1968Fu03).
2660	2+	0+2	0.43, 0.4	(2J+1)S: From 1968Fu03.
2913	$(2,3)+^\#$	0+2	0.38, 0.5	(2J+1)S: Other: 0.24, 1.1 ((d,n) – 1968Fu03).
3073				
3159	2+	0+2	1.3, 2.4	(2J+1)S: Other: 1.2, 1.1 ((d,n) – 1968Fu03).
3596	$(2,3)+^\#$	0+2	0.21, 0.6	(2J+1)S: Other: 0.20, 0.63 ((d,n) – 1968Fu03).
3674				
3680	$(2,3)+^\#$	0+2	0.35, 2.5	(2J+1)S: For doublet. Other: 0.35, 2.3 ((d,n) – 1968Fu03).
3723.81				$E(\text{level})$: From Adopted Levels.
3750	$(2,3)+^\#$	0+2	0.96, 1.7	(2J+1)S: For doublet. Other: 0.67, 1.6 ((d,n) – 1968Fu03 – for triplet).
3753.63 13				$E(\text{level})$: From Adopted Levels.
4191	3+	0+2	1.3, 2.9	(2J+1)S: For doublet. 1.2, 2.4 – ((d,n) – 1968Fu03 – for doublet).
4205				
4599.17 ^a	$(2,3)+$	0+2 ^a	1.4, 0.78 ^a	(2J+1)S: Other: 0.47 for $L=0$ ((d,n) – 1968Fu03) – for doublet.
4622.38				$E(\text{level})$: From Adopted Levels.
4705.37 ^a	4+	2 ^a	1.2 ^a	(2J+1)S: Other: 0.55 ((d,n) – 1968Fu03).
4773.35 ^a	4+	2 ^a	1.7 ^a	(2J+1)S: Other: 0.75 ((d,n) – 1968Fu03).
5141.68 ^a	2+	0+2 ^a	0.60, 1.5 ^a	(2J+1)S: Other: 0.24, 0.94 ((d,n) – 1968Fu03).
5245.28 ^a	4+	2 ^a	2.7 ^a	(2J+1)S: Other: 1.4 ((d,n) – 1968Fu03).
5395.53 ^a	4–	1, 3 ^a	0.72, 1.4 ^a	(2J+1)S: Other: 0.39 ((d,n) – 1968Fu03).
5431.23 $\frac{7}{2}$				
5456.71 ^a	3–	1 ^a	0.42 ^a	$L,(2J+1)S$: Listed for 5442 keV level in 1978Be28. Probably for a doublet. (2J+1)S: Other: 0.31 ((d,n) – 1968Fu03).
5461.87 ^a	0+, (1,2)	0+2 ^a	0.06, 0.06 ^a	$L,(2J+1)S$: Listed for 5469 keV level in 1978Be28. Probably for a doublet.
5487.93 $\frac{7}{2}$				
5494.51 5	2+	0+2	0.08, 0.78 ^b	$E(\text{level})$: From Adopted Levels.
5513.48 ^a	4+	2 ^a	4.3 ^a	$E(\text{level})$: 5525 in 1987Be28.
5544.56	2+	2	3.1	
5682 $\frac{1}{2}$	1+	0+2	1.3, 2.2	$L,(2J+1)S$: $L=0$ – presumably erroneous.
5692.15 ^a	3–	1 ^a	1.0 ^a	
5726.38 ^a	4+	1+3 ^a	0.42, 1.2 ^a	$L,(2J+1)S$: $L=3$ – presumably erroneous.
5916.10 ^a	2–	1+3 ^a	0.78, 1.2 ^a	$L,(2J+1)S$: Listed for 5932 keV level in 1978Be28. Probably for a doublet. (2J+1)S: Other: 0.24 ((d,n) – 1968Fu03).
5924.19 $\frac{7}{2}$				
6084.07 $\frac{7}{2}$	(5–)	2	3.4	L : For doublet. $L=3$ – probably erroneous – in 1986Pe01, 1988Pe14, 1989Ya13.
6086.47 $\frac{7}{2}$	(1–, 2+)			

Continued on next page (footnotes at end of table)

$^{25}\text{Mg}({}^3\text{He,d}),(\text{d,n})$ 1968We04,1988Pe14,1996Il01 (continued) **^{26}Al Levels (continued)**

E(level) [†]	$J\pi^{\S}$	L [@]	(2J+1)S [@]	Comments
6254.06 ^a	3-	(1) ^a	0.12 ^a	
6270.19 [‡]	1+			
6280.33 ^a	3+	0+2 ^a	0.30, 0.36 ^a	L,(2J+1)S: Listed for 6290 keV level in 1978Be28. Probably for a doublet.
6360 ^c	(1 to 4)- ^c	1 ^c		
6565 ^c	(0 to 5)+ ^c	2 ^c		
6613 ^c	(1 to 4)- ^c	1 ^c		
6689 ^c	(2,3)+ ^c	0 ^c		
6734 ^c	(1 to 4)- ^c	1 ^c		
6797 ^c	(1 to 4)- ^c	1 ^c		
6828 ^c	(1 to 4)- ^c	1 ^c		
6899 ^c	(1 to 6)- ^c	3 ^c		E(level),(2J+1)S: From 1988Pe14. Other value: 6899 keV (1978Be28). J π ,L: From 1978Be28. L=3 also in 1988Pe14.
6964& 5		3	1.7&	
7168& 5		3	0.41&	
7524& 5		3	1.4&	
8007& 10		3	1.1&	
8064& 10		3	2.0&	
9264& 15		3	2.2&	
11966& 15		3	0.60&	
12405& 15		3	0.38&	
12554& 15		3	0.22&	
13250& 20				
14050& 20		3	0.16&	
14744& 20		3	0.23&	
15371& 20		3	0.12&	
16550& 20		3	0.16&	

[†] Levels up to 4205 are reported in 1968We04.[‡] From Adopted Levels.[§] From Adopted Levels, except otherwise noted.

Assigned in 1968We04 from L value.

[@] From 1968We04, except otherwise noted. Evaluated spectroscopic factors (1990En08, 1977En02) are listed here. N=4.0 changed into 4.42.

& From 1988Pe14.

^a From 1978Be28. Level energies in 1978Be28 were taken from 1972Be51, evaluators quote those from Adopted Levels.^b From (d,n) - 1968Fu03. Evaluated spectroscopic factors (1990En08, 1977En02) from 1968Fu03 are listed here. N=1.0 changed to 1.53.^c From 1978Be28. **$^{25}\text{Mg}(\alpha,\text{t})$ 1990Ya07,1986Pe01,1989Ya03**

Other: 1990Ya07.

1990Ya07: Self-supporting metallic 97.9% enriched ^{25}Mg target (thickness 80 $\mu\text{g}/\text{cm}^2$); 50 MeV α beam; Reaction products were momentum analyzed using magnetic spectrograph; Single wire proportional counter, ΔE and E counters; FWHM 25 MeV; Deduced excited levels of ^{26}Al , spectroscopic factors.1986Pe01: 98.25% enriched ^{25}Mg target (thickness 513 $\mu\text{g}/\text{cm}^2$) bombarded with α beam, E=80.9 MeV; Quadrupole-dipole-dipole magnetic spectrometer; Measured triton spectra, FWHM 80 keV; DWBA calculations; Deduced spectroscopic factors.1989Ya03: 97.9% enriched ^{25}Mg target (thickness 80 $\mu\text{g}/\text{cm}^2$) bombarded with α beam, E=80.9 MeV; Quadrupole-dipole-dipole magnetic spectrometer; Measured triton spectra, FWHM 20 keV; DWBA calculations; Deduced spectroscopic factors. **^{26}Al Levels**

E(level) [†]	$J\pi^{\ddagger}$	L	S [#]	Comments
0.0	5+		1.03	
227	0+		1.01	
415	3+		0.90	
1061	1+		1.0	

Continued on next page (footnotes at end of table)

$^{25}\text{Mg}(\alpha, t)$ 1990Ya07, 1986Pe01, 1989Ya03 (continued) ^{26}Al Levels (continued)

$E(\text{level})^\dagger$	$J\pi^\ddagger$	L	S [#]	Comments
1758	2+		1.43	
1851	1+		1.32	
2066	(2+)		1.07	
2364	3+		1.25	
2546	3+		1.33	
2659	2+		0.56	
2742	1+		1.25	
2913	2+			
3073	3+		1.43	
3162	2+		1.0	
3401	5+		1.0	
3511	6+			
3598	3+		2.17	
3677	3+		3.08	
3753	2+		1.0	
3926	7+, (5+)			
3964	(3+)		0.33	
4194	(3+)		1.56	
4350	3+		2.5	
4430	2-			
4482	0-			
4551	2+		1.36	
4698	(4+)		2.25	
4769	4+		4.33	
4947	(3+)		2.0	
5018	(1+)		1.43	
5145	(2+)		0.89	
5261	(4+)		1.9	
5551	(2+)		1.38	
5730	(4+)		0.46	
5848	(2+)		5.3	
5890	(3+)		(0.9)	
6891.70\$ 4	(6-)	3	0.17@	S: Other: 0.16 (1989Ya03).
6964.48\$ 9	(3-)	3	0.17&	
7108.71\$ 8	(4-)	3	0.03@	
7167.65\$ 6	(4-)	3	0.04@	
7347.89\$ 10	(4-)	3	0.16@	
7409.62\$ 8	(4-)	3	0.12@	
7529.26\$ 5	(6-)	3	0.09@	S: Other: 1.9 (1989Ya03).
7548.20\$ 9	(5-)	3	0.03@	
8011\$	(5-)	3	0.15@	S: Other: 1.5 (1989Ya03).
8067\$	(5-)	3	0.2@	S: Other: 2.1 (1989Ya03).
9271\$		3	0.22@	S: Other: 2.5 (1989Ya03).

[†] From 1990Ya07, except otherwise noted.[‡] From Adopted Levels.

\$ From Adopted Levels.

From 1990Ya07.

@ From (2J+1)S in 1986Pe01, except otherwise noted.

& From (2J+1)S in 1989Ya03.

$^{25}\text{Mg}(^{11}\text{B},^{10}\text{Be})$ 2006De32

97% enriched ^{25}MgO target (thickness 20 $\mu\text{g}/\text{cm}^2$) on carbon backing (thickness=15 $\mu\text{g}/\text{cm}^2$); Projectile: ^{11}B beam, E=35 MeV; Three ΔE -E telescope formed by gas proportional counters as the ΔE and silicon surface barrier detector as E; FWHM 200 keV; Measured beryllium spectra, angular distribution; DWBA calculations; deduced spectroscopic factors.

 ^{26}Al Levels

E(level) [†]	J π [†]	T _{1/2} [†]	L	C ² S [‡]	Comments
0.0	5+	7.17×10 ⁵ y 24		0.203	C ² S: Other value: 0.302 (PSP).
228.305 13	0+	6.3460 s 8		0.593	C ² S: Other value: 0.835 (PSP).
416.852 3	3+		0	0.108	C ² S: Other values: 0.072 (POT2) and 0.072 (PSP) for L=2; 0.208 (PSP) for L=0.
1057.739 12	1+			0.655	C ² S: Other value: 0.970 (PSP).
1759.034 8	2+		2	0.336	C ² S: Other value: 0.524 (PSP).

[†] From Adopted Levels.

[‡] Considering Wood-Saxon potential (POT2). Other value, considering Sao Paulo Optical potential (PSP), listed as comments.

 $^{26}\text{Mg}(\text{p,n}),(\text{p,n}\gamma)$ 1987Ma19,1988Le17,1972Pr09

Others: 1994Br11,1987Ra23,1987Sk01,1985Wa24,1981No03,1980Be23,1980Go07, 1980Pa14,1980St08,1979Ki02.

J $\pi(^{26}\text{Mg})=0+$.

1987Ma19: (p,n) – 99.45% enriched ^{26}Mg target; proton beam, E=134.4 MeV; three NE102 plastic scintillators,

Time-of-flight spectra, FWHM 370 keV for 128.5 MeV neutrons, DWIA calculation; deduced Gamow-Teller strengths.

1988Le17: (p,n) – 99.45% enriched ^{26}Mg target; proton beam, E=135 MeV; Neutrons were detected using three rectangular bars of fast plastic scintillator; Time-of-flight spectra were measured in approximately 4° steps from 0° to 63°; measured cross sections, DWIA calculations, deduced excited levels, spin and parity.

1972Pr09: (p,n γ) – ^{26}Mg target (thickness 1 mg/cm²) on gold backing bombarded by proton beams, E=7.4 MeV;

Ge(Li)-NaI(Tl) escape suppressed and pair-escape spectrometer; Measured E γ , I γ , γ -ray angular distribution;

Deduced level scheme, spin and parity.

 ^{26}Al Levels

E(level) [†]	J π	L	Comments
0.0	5+ [§]		
228.305 13		0	A precision measurement of the threshold for the excitation of 1st excited state in (p,n) reaction has yielded E _(-threshold) =5209.46 keV 12 (1994Br11).
416.852 3	3+		
1057.739 12		0	
1850.62 3		0	
2068.86 5	4+ [#]	0 [‡]	
2069.47 3		0 [‡]	
2071.64 4	1		
2740.03 3		0	
3402.65 6	5+ [§]		
3723.81 4		0	
6891.70 4	6- [§]		
10660 10	6- [§]		

[†] From Adopted Levels, except otherwise noted.

[‡] L=0 for triplet (1987Ma19).

[§] From angular distribution measurements and DWIA calculations (1988Le17).

[#] From 1972Pr09, based on γ -ray angular distribution measurements.

$^{26}\text{Mg}(^3\text{He},t)$ 2006Ze01,2003Fu07 $J\pi(^{26}\text{Mg})=0+$.Other reaction: $^{25}\text{Mg}(^6\text{Li},^6\text{He})$: 1999Ue03 – Deduced Gamow–Teller transition strengths.2006Ze01: E=140 MeV/nucleon. Measured tritons, $\sigma(\theta)$ using the Grand Raiden spectrometer. FWHM=100 keV, DWBA analysis. Deduced Gamow–Teller B(GT) strengths.

2003Fu07: E=140 MeV/nucleon. Measured tritons using a QDD-type Grand Raiden spectrometer with a multiwire drift-chamber system. FWHM=100 keV, DWBA analysis. Deduced Gamow–Teller B(GT) strengths.

 ^{26}Al LevelsR=DWBA_(corrected)/experiment.

E(level) [†]	$J\pi$ ^{&}	L ^b	B(GT) ^d	Comments
0.0 [‡]	5+			
228 [#] 2	0+	0		T=1. Isobaric analogue state (2006Ze01). $d\sigma/d\Omega(0^\circ)=4.0$ mb/sr 1 (2006Ze01). R=1.80 5 (2006Ze01).
417 [‡] 2	3+	c		
1058 [@] 2	1+	0	1.09 3	T=0. Other B(GT)=1.08 3 (2003Fu07). $d\sigma/d\Omega(0^\circ)=13.9$ mb/sr 3 (2006Ze01). R=1.62 4 (2006Ze01).
1850 [@] 2	1+	0	0.54 2	Other B(GT)=0.527 15 (2003Fu07). $d\sigma/d\Omega(0^\circ)=6.7$ mb/sr 2 (2006Ze01). R=1.60 5 (2006Ze01).
2071 [@] 2	1+	0	0.114 8	Other B(GT)=0.112 4 (2003Fu07). $d\sigma/d\Omega(0^\circ)=1.45$ mb/sr 3 (2006Ze01). R=1.43 3 (2006Ze01).
2545 [‡] 2		c		
2739 [@] 2	1+	0	0.119 8	Other B(GT)=0.117 4 (2003Fu07). $d\sigma/d\Omega(0^\circ)=1.50$ mb/sr 3 (2006Ze01). R=1.31 3 (2006Ze01).
2915 [‡] 2		c		
3158 [#] 2	2+	c		T=1.
3597 [‡] 2		c		
3726 2		0	0.109 8	Other B(GT)=0.106 4 (2003Fu07).
4428 [#] 2	2–	c		T=0.
4603 [‡] 2		c		
5010 2		0	0.28 1	Other B(GT)=0.271 8 (2003Fu07).
5583 [‡] 2			0.020 ^e 1	
5949 2		0	0.041 5	E(level): Other: 5940 keV (2006Ze01). Other B(GT)=0.037 2 (2003Fu07).
6269 2		0	0.134 8	Other B(GT)=0.126 4 (2003Fu07).
6683 [‡] 2		c		
6875 2		0	0.028 4	E(level): Other: 6870 keV (2006Ze01). Other B(GT)=0.028 1 (2003Fu07).
7199 2		0	0.089 6	Other B(GT)=0.085 3 (2003Fu07).
7457 2		0	0.036 4	Other B(GT)=0.038 2 (2003Fu07).
7608 [‡] 2		c		
7813 2		0	0.037 4	Other B(GT)=0.040 2 (2003Fu07).
8276 [‡] 4		c		
8532 [‡] 4		c		
8774 [‡] 4		c		
8930 4		0	0.041 ^f 2	
9007 4		0	0.079 ^f 3	
9430 [§]			0.136 8	
9620 [§]			0.079 7	
9860 [§]			0.058 6	
10240 [§]			0.158 9	
10450 [§]			0.29 1	
10810 [§]			0.47 2	
11220 [§]			0.164 9	
11500 [§]			0.021 5	
11620 [§]			0.17 1	
12010 [§]			0.015 3	
12410 [§]			0.022 4	

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$^{26}\text{Mg}(^3\text{He},t)$ 2006Ze01,2003Fu07 (continued) **^{26}Al Levels (continued)**

E(level) [†]	J π ^{&}	B(GT) ^d	Comments
13570 §	1+a	0.068 3	T=2.
14530 §		0.015 4	
14880 §		0.018 5	
15910 §		0.029 6	
18320 §		0.021 5	

[†] From 2003Fu07, except otherwise noted. Also reported in 2006Ze01.

[‡] Reported only in 2003Fu07.

§ Reported only in 2006Ze01.

From figure 4 of 2006Ze01.

@ Gamow-Teller transition (2006Ze01).

& From Adopted Levels, except otherwise noted.

a From 2006Ze01.

b From 2003Fu07.

c $\neq 0$ (2003Fu07).

d From 2006Ze01, except otherwise noted.

e From 2003Fu07.

f B(GT)=0.123 8 in 2006Ze01 for 8980 keV level is comparable with total B(GT) value for levels 8930 and 9007 in 2003Fu07.

 $^{27}\text{Al}(p,d),(^3\text{He},\alpha)$ 1976Sh17,1988Pe19,1973Be27

J $\pi(^{27}\text{Al})=5/2+$.

Other references: for (p,d) – 1988Le08, 1973Kr08, 1969HaZD.

Other references: for ($^3\text{He},\alpha$) – 1989Su17,1986Ch09,1986Gu03,1985Wi03, 1983Ch17,1982Bu15,1980Al20.

1976Sh17: $^{27}\text{Al}(p,d) - E(p)=35$ MeV; First phase – thin Al target (thickness 60 $\mu\text{g}/\text{cm}^2$), deuterons were detected in Kodak NTB 25 μm nuclear emulsions, FWHM 6 keV; Second phase – thick Al target (thickness 2.5 μm), deuterons were detected with a position-sensitive single-wire proportional counter; FWHM=50 keV; measured deuteron spectra, angular distributions, deduced excited level energy, L value, spectroscopic factors.

1988Pe19: $^{27}\text{Al}(p,d) -$ Natural aluminum target; 35.19 MeV proton beam; reaction product analyzed by a magnetic spectrometer, hybrid drift chamber; Measured deuteron momentum spectrum; deduced excited level energies, spectroscopic factors.

1973Be27: $^{27}\text{Al}(^3\text{He},\alpha) - ^{27}\text{Al}$ target (thickness 35 $\mu\text{g}/\text{cm}^2$) bombarded with 18-MeV ^3He beam; α particles were detected in Ilford K-1 nuclear emulsions after being momentum-analyzed in a multiangle spectrograph; measured $\sigma(E_\alpha, \theta)$, deduced excited level, J, π , L, spectroscopic factors.

 ^{26}Al Levels

E(level) [†]	L [†]	S [†]	Comments
0.0	2	1.00	S: Other: 1.3 (1973Be27).
228.2 [‡]	2	0.42	S: Other: 0.53 (1973Be27).
416.8 [‡]	0+2	0.15, 0.05	S: Other: 0.16 (1973Be27).
1057.8 [‡]	2	0.31	S: Other: 0.40 (1973Be27).
1758.5 10	0+2	0.02, 0.02	S: Other: 0.01, 0.02 (1973Be27).
1849.9 10	2	0.02	S: Other: 0.02 (1973Be27).
2069.2 10			E(level): Unresolved triplet.
2365.1 [‡]	0+2	0.02, 0.23	S: Other: 0, 0.34 (1973Be27).
2544.7 13	0+2	0, 0.30	S: Other: 0, 0.39 (1973Be27).
2662.5 20			
2740.1 14			
2913.1 [‡]	0+2	0.00, 0.03	
3072.8 15			
3159.3 16	0+2	0.01, 0.30	S: Other: 0, 0.41 (1973Be27).
3402.4 17	2	0.09	S: Other: 0.11 (1973Be27).
3507.4 17			
3595.9 18	0+2	0.00, 0.01	S: Other: 0.01, 0.01 (1973Be27).
3675.0 20			
3681.0 20	0+2	0.01, 0.16	S: Other: 0.02, 0.18 (1973Be27).
3723.4 19	2	0.02	

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$^{27}\text{Al}(\text{p,d}),(^3\text{He},\alpha)$ 1976Sh17,1988Pe19,1973Be27 (continued) ^{26}Al Levels (continued)

E(level) [†]	L [†]	S [†]	Comments
3751.3 19	0+2	0.02, 0.03	E(level): Unresolved 4-keV doublet (1976Sh17). S: Other: 0.03, 0.02 (1973Be27).
3922.5 19			
3963.1 20	0+2	0.05, 0.08	S: Other: 0.04, 0.11 (1973Be27).
3976 3			
4190.5 21	0+2	0.01, 0.03	S: Other: 0.00, 0.04 for doublet (1973Be27).
4205.5 21	2	0.02	
4348.5 22	2(+0)	0, 0.03	
4429.5 22	1+3	0.02, 0.05	S: Other: 0.03, 0 (1973Be27).
4545.7 22	0+2	0.06, 0.15	S: Other: 0.08, 0.23 (1973Be27).
4597.5 23	0+2	0.09, 0.06	S: Other: 0.08, 0.09 (1973Be27).
4703.5 23	2	2.1	S: Others: 3.3 (1973Be27), 2.3 (1985Wi03).
4770.5 24	2	0.02	
4938.5 24	1+3	0.02, 0.02	
4949.5 25	2(+0)	0, 0.03	S: Other: 0, 0.08 (1973Be27).
5005.5 25	2	0.02	
5139 3	0+2	0.09, 0	S: Other: 0.23, 0 (1973Be27).
5194 5			
5244 3			
5392 3			
5453 3			
5491 3			
5509 3			
5541 3	0+2	0.02, 0.03	
5566.4 3			
5595.3 3	1+3	0.12, 0.02	S: Other: 0.22, 0 (1973Be27).
5671 3			
5688 3			
5723 3	2	0.36	S: Other: 0.70 (1973Be27).
5845 3			
6884		0.004	
7528		0.006	
7562		0.031	
8001		0.044	
8065		0.051	
9260		0.033	

[†] From 1976Sh17, except otherwise noted.[‡] Used for energy calibration in 1976Sh17. **$^{27}\text{Al}(\text{d,t})$ 2015Sr03** $J\pi(^{27}\text{Al g.s.})=5/2+$.

Target: Self-supported ^{27}Al target of thickness 90 $\mu\text{g}/\text{cm}^2$; Projectile: deuteron beam, $E=25\text{-MeV}$. Transfer-channel angular distributions were measured with a three-element telescope comprising a single-sided 55 μm Si (ΔE) strip detector, a double-sided 1030 μm Si (E) strip detector, backed by four CsI(Tl) detectors. Ejectiles were measured over an angular range from 16 to 40 degrees in the lab. Excited states were measured in ^{26}Al and analyzed using a zero-range distorted-wave Born approximation (DWUCK4) to extract spectroscopic factors and L -transfer values for the observed states. Results compared with previous measurements.

 ^{26}Al Levels

E(level)	$J\pi^{\dagger}$	L	$C^2S^{\ddagger}$	Comments
0.0 4	5+	2	0.73 21	$C^2S/C^2S(\text{g.s.})=1$.
230 4	0+	2	0.09 3	$C^2S/C^2S(\text{g.s.})=0.12$ (2015Sr03), 0.15 (1973Kr08), 0.14 (1976Sh17), 0.14 (1973Be27), and 0.15 (1968Nu01).

Continued on next page (footnotes at end of table)

$^{27}\text{Al}(\text{d},\text{t})$ 2015Sr03 (continued) **^{26}Al Levels (continued)**

E(level)	$J\pi^\dagger$	L	$\text{C}^2\text{S}^\ddagger$	Comments
420 4	3+	2 (+0)	0.32 7	C ² S: for L=2; 0.07 3 for L=0 (see comment on L-transfer). C ² S/C ² S(g.s.)=0.44 (2015Sr03), and 0.05 (1976Sh17) for L=2. C ² S/C ² S(g.s.)=0.09 (2015Sr03), 0.18 (1973Kr08), 0.15 (1976Sh17), 0.12 (1972Be07), and 0.12 (1968Nu01) and for L=0. L: experimental angular distribution and DWBA calculations are in better agreement for L=2 transfer; the deduced spectroscopic factor assumes neutron pickup from the $0\text{d}_{5/2}$ single-particle orbital. A value of C ² S=0.07 3 is obtained for the 420-keV state for an L=0 transfer assuming pickup from the $1\text{s}_{1/2}$ orbital; experimental angular distributions and DWBA calculations yield poorer agreement for this scenario.
1056 4	1+	2	0.17 5	C ² S/C ² S(g.s.)=0.24 (2015Sr03), 0.24 (1973Kr08), 0.31 (1976Sh17), 0.31 (1973Be27), and 0.29 (1968Nu01).
1762 6	2+	2	0.038 6	C ² S/C ² S(g.s.)=0.05 (2015Sr03), 0.07 (1973Kr08), 0.02 (1976Sh17), and 0.02 (1973Be27).
1848 8	1+	2	0.019 4	C ² S/C ² S(g.s.)=0.03 (2015Sr03), 0.05 (1973Kr08), 0.016 (1976Sh17), and 0.02 (1973Be27).
2070 4		2	0.26 6	C ² S/C ² S(g.s.)=0.35 (2015Sr03), 0.50 (1973Be27), and 0.52 (1976Sh17).
2365 4	3+	2	0.13 2	E(level),L: For triplet. C ² S/C ² S(g.s.)=0.05 (2015Sr03), 0.28 (1973Kr08), 0.23 (1976Sh17), and 0.26 (1973Be27).
2542 4	3+	2	0.16 3	C ² S/C ² S(g.s.)=0.22 (2015Sr03), 0.28 (1973Kr08), 0.30 (1976Sh17), and 0.30 (1973Be27).
3160 5	2+	2	0.06 1	C ² S/C ² S(g.s.)=0.08 (2015Sr03), 0.12 (1973Kr08), 0.10 (1976Sh17), and 0.10 (1973Be27).
3409 8	5+	2	0.06 1	C ² S/C ² S(g.s.)=0.09 (2015Sr03), 0.19 (1973Kr08), 0.09 (1976Sh17), and 0.08 (1973Be27).
3505 5	6+	4	0.06 3	C ² S/C ² S(g.s.)=0.08 (2015Sr03), and 0.04 (1976Sh17).
4443 6	2-	1	0.23 4	C ² S/C ² S(g.s.)=0.32 (2015Sr03), 0.02 (1976Sh17), and 0.02 (1973Be27).
4719 4	(4+)	2	0.27 8	C ² S/C ² S(g.s.)=0.37 (2015Sr03), 1.00 (1973Kr08), 0.71 (1976Sh17), and 0.86 (1973Be27).

[†] From Adopted Levels.[‡] The spectroscopic factors for different excited states of ^{26}Al relative to that of its ground state, C²S/C²S(g.s.) where C²S(g.s.)=0.73, are also presented and compared to previous works. **$^{28}\text{Si}(\mu^-, \nu 2n\gamma)$ 2007Me18**The μ^- beam obtained from decay of π^- beam at 90 MeV/c. Measured γ -ray yields using two HPGe detectors.-----
Muonic Lyman (or K) series for Silicon

μ x-ray	Energy	Intensity (in % per capture)
2p-1s	400.177 a)	80.3 8
3p-1s	476.80 5	7.40 20
4p-1s	503.58 10	4.27 20
5p-1s	515.97 10	3.83 20
6p-1s	522.74 10	2.29 10
(7p to ∞ p)-1s		1.87 20
a): 400.177-keV x ray used for calibration		

 ^{26}Al Levels

E(level) [†]	$J\pi^\dagger$	Percent direct yield/muon capture	Comments
0.0	5+	1.0 3	Percent direct yield/muon capture: Estimated from (d, α) reaction.
228.30	0+		Known cascading=2.8%.
			Known cascading=1.9% 4.
			This level decays by β^+ .
416.85	3+	0.75 25	Known cascading=0.15% 15.
1057.74	1+	0.65 22	
1759.03	2+	0.15 15	
1850.62	1+	1.2 4	
2068.86	(4+)	<0.4	
2069.47	(2+)	<0.5	
2071.64	1+	0.16 8	

[†] From Adopted Levels.

$^{28}\text{Si}(\mu^-, \nu 2n\gamma)$ 2007Me18 (continued) $\gamma(^{26}\text{Al})$

$E\gamma^\dagger$	E(level)	$I\gamma^\ddagger\%$	Comments
416.85	416.85	0.9 2	
829.49	1057.74	0.65 22	
1011.71	2069.47	<0.26	
1342.15	1759.03	0.15 15	
1622.26	1850.62	1.2 4	I γ : mixed with 1622.86 keV transition in ^{28}Al .
1651.95	2068.86	<0.26	
1652.56	2069.47	<0.38	
1843.26	2071.64	0.14 7	
2068.77	2068.86	<0.13	

 † From Adopted Gammas. ‡ Percent yield per muon capture. $\%$ Absolute intensity per 100 incident particles. **$^{28}\text{Si}(\text{p}, ^3\text{He})$ 2012Ch31** $J\pi(^{28}\text{Si})=0^+$.

Target: 92% enriched ^{28}Si (thickness 200 $\mu\text{g}/\text{cm}^2$; Projectile: proton, E=40 MeV; Recoiling ^3He particle spectra measured using SIDAR array, in ΔE -E arrangement. FWHM=80–180 keV. Protons from the excited states were detected using ORRUBA array, consists of six 65-mm-thick non-resistive strip silicon detectors; Proton- ^3He coincidences were measured to obtain proton branching ratios. The $\sigma(\theta)$ distributions were also measured and analyzed using DWBA analysis.

The %p branching ratios were determined from (^3He)p coincidences.S(p)(^{26}Al)=6306.31 5 (2012Wa38). ^{26}Al Levels

E(level) $^\dagger\%$	$J\pi^\circ$	L&	Comments
0.0 6	5+		
223 10	0+	0	
424 10	3+		
1061 5	1+		
1834 9	1+		
2073 $\%$ 7	4+, 2+, 1+		
2362 8	3+		
2552 7	3+		
2907 4	2+		
3161 5	2+		
3417 9	5+		
3714 15	1+		
3980 9	0-		
4439 7	2-		
4722 9	(4+)		
4978 $\%$ 9	3+, 2-		
5196 14	(0+)		
5592 $\%$ 31	(2, 3)-	(1, 2)	
5687 $\%$ 26	(3-)		
5965 10	1(+)		
6290 22	(3+)		
6417 $\%$ 19			
6827 $\%$ 30			%p=47 24 (2012Ch31).
7163 $\%$ 14			%p=76 29 (2012Ch31).
7489 $\%$ 33			%p=90 65 (2012Ch31).
			%p is for 7489+7627.
7627 $\%$ 20			%p=90 65 (2012Ch31).
			%p is for 7489+7627.
7910 $\%$ 29	(5+, 6+)	(1, 2)	%p=115 21 (2012Ch31).
			L: ≥ 4 value could not be ruled out in 2012Ch31.
8183 $\%$ 17		(1, 2)	%p=70 11 (2012Ch31).

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$^{28}\text{Si}(\text{p},^3\text{He})$ 2012Ch31 (continued) **^{26}Al Levels (continued)**

E(level) ^{†‡}	J π [@]	L ^{&}	Comments
8369# 30		2	%p=86 72 (2012Ch31). %p is for 8369+8616.
8616 21	(5,6)+	1	%p=86 72 (2012Ch31). %p is for 8369+8616. J π : previous (5,6)+ inconsistent with L=1 in 2012Ch31.
8815# 19		(3)	%p=78 36 (2012Ch31).
9060 16	(4)	(1,3)	%p=48 15 (2012Ch31).
9397# 21		(1,3)	%p=73 35 (2012Ch31).
9547# 22		(3)	
9920 26	(5-)		

[†] Known energies at 0, 228, 417, 1058, 1851, 2070, 2365, 2545, 2913. 3160, 3403, 4431, 5195, 5950, 6852, 9060 were used for calibration.

[‡] From 2012Ch31.

[§] doublet or multiplet.

New level reported in 2012Ch31.

@ From Adopted Levels.

& From DWBA analysis of $\sigma(\theta)$ distributions in 2012Ch31.

 $^{28}\text{Si}(\text{d},\alpha),(\text{pol d},\alpha)$ 1981Ta04,1986Bo02

J $\pi(^{28}\text{Si})=0+$.

Other: 1978Ik01,1986Da09 – (pol d, α).

1981Ta04: (d, α): target: ^{28}Si self-supporting foil (estimated thickness 67 $\mu\text{g}/\text{cm}^2$), Projectile: deuteron beam,

E=33.0 MeV; Alpha particles were analyzed with a magnetic spectrograph; FWHM=30 keV; Deduced excitation energy, L values. Also studied $^{24}\text{Mg}(^3\text{He},\text{p})$ reaction.

1986Bo02: (pol d, α): Natural silicon (thickness 30 to 50 $\mu\text{g}/\text{cm}^2$) evaporated on 99.9% enriched ^{12}C ; 60 μm thick

annular Si surface barrier detector, α particles detected between 174.1° to 176.5°; Measured α spectra; FWHM 35 to 40 keV; Assigned natural and unnatural parity.

 ^{26}Al Levels

E(level) [†]	J π	L ^b	Comments
0.0	5+ [§]	4	J π : From Cross-section and vector analyzing-power angular distribution for the (pol d, α) (1978Ik01).
230 6	@		
418 6	[§]	2	
1058 6	[§]	0+2	
1762 6	[‡]	2	
1850 6	[§]	0+2	
2065 6		4 ^c	
2069.47 3	[‡] @		
2071.64 4	[§]		
2369 6	[§]	4	
2542 6	[§]	2(+4)	
2661 6	[‡]	2	
2735 6	[§]	0+2	
2914 6	[‡]	2	
3075 6	[§]	2(+4)	
3159.889 13	[‡]		
3403 6	[§]	4	
3506 6	[‡]	6	
3600 6	[§]	2	
3674.92 5	[‡]		
3681 6	[§]	2	
3723.81 4	[§]		
3750 6	[‡] @	2d	
3753.63 13			
3920 6	[§]		

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$^{28}\text{Si}(\text{d},\alpha),(\text{pol d},\alpha)$ 1981Ta04,1986Bo02 (continued) **^{26}Al Levels (continued)**

$E(\text{level})^\dagger$	$J\pi$	L^b	$E(\text{level})^\dagger$	$J\pi$	L^b	$E(\text{level})^\dagger$	$J\pi$
3962.83 5	§	1 ^d	4940.79 5		2+4	5544.56 7	§#&
3977.91 9	0 ^{-a}	d	4952.30 4	§		5569.16 19	
4191.92 6	§		5006.66 16	§&		5584.99 6	§&
4205.86 5	‡		5010.24 7			5598.30 6	
4349.34 7	§		5131.93 5	‡@		5671.04 7	§&
4430.72 6	§	1	5141.68 6			5676.07 5	
4480.48 9	0 ^{-a}		5195.11 12	(0 ⁺) ^a		5692.15 5	‡#
4547.92 6	‡#		5245.28 4	‡		5726.38 5	
4599.17 5	§		5395.53 7	§		5849.21 8	‡#
4622.38 5	§		5431.23 10	‡#		5882.65 9	‡
4705.37 4	‡#		5487.93 6	§&		5916.10 6	§&
4769 6	‡	4	5494.51 5			5924.19 7	
4939.64 9	§&		5513.48 4	‡		5949.93 8	‡#

[†] From Adopted Levels. Excited levels with 6 keV uncertainty are from 1981Ta04.

‡ Natural parity (1986Bo02).

§ Unnatural parity (1986Bo02).

Considered as a possibility (1986Bo02).

@ One of the doublet components has natural parity and the other has natural parity or 0⁺.

& One of the doublet components has unnatural parity, other undetermined.

^a From 1986Bo02 (pol d,α).

^b From 1981Ta04.

^c For triplet.

^d For doublet.

Adopted Levels, Gammas

$Q(\beta^-) = -18110$ SY; $S(n) = 19040$ IO; $S(p) = 5513.8$ 5; $Q(\alpha) = -9166.0$ 3 2012Wa38.
 $\Delta Q(\beta^-) = 200$ (syst) (2012Wa38).

 ^{26}Si Levels**Cross Reference (XREF) Flags**

A ^{26}P ϵ Decay
 B ^{27}S β^+p Decay
 C $^1\text{H}(^{25}\text{Al}, p)$
 D $^1\text{H}(^{27}\text{Si}, ^{26}\text{Si}\gamma)$

E $^{12}\text{C}(^{16}\text{O}, 2n\gamma)$
 F $^{24}\text{Mg}(^3\text{He}, n)$
 G $^{24}\text{Mg}(^3\text{He}, n\gamma)$
 H Coulomb Excitation

I $^{28}\text{Si}(p, p2n\gamma)$
 J $^{28}\text{Si}(p, t)$
 K $^{28}\text{Si}(\alpha, ^6\text{He})$
 L $^{29}\text{Si}(^3\text{He}, ^6\text{He})$

E(level) [†]	J $\pi^{\#}$	XREF	T _{1/2} ^e	Comments
0.0	0+	A DEFGH J L	2.2453 s 7	% ϵ +% β^+ =100. T=1. J π : L=0 in $^{24}\text{Mg}(^3\text{He}, n)$. T _{1/2} : From 2010Ia01, the composite time decay of ^{26}Si (parent) and ^{26m}Al (daughter) was analyzed. The measurement described in 2010Ia01 disagrees with the other precision half-life measurement of 2008Ma39 (T _{1/2} =2.2283 s 27). The authors of 2010Ia01 propose that the result of 2008Ma39 should be discarded since they did not correct for parent-daughter detection-efficiency differences. The β -decay mode $0^+(^{26}\text{Si g.s.}) \rightarrow 0^+(^{26m}\text{Al } 228.3\text{-keV isomer})$ is a superallowed transition. Other values: 2.1 s 3 (1960Ro06), 2.1 s 1 (1963Fr10), 2.1 s 2 (1971Mo27), 2.202 s 23 (1972Ha58), 2.210 s 21 (1975Ha21), and 2.240 s 10 (1980Wi13).
1797.30 10	2+@	AB DEFGH JKL	440 fs 40	J π : L=2 in $^{24}\text{Mg}(^3\text{He}, n)$. 1797.2 γ E2 to 0+. T _{1/2} : Average of 430 fs 42 ($^3\text{He}, n\gamma$) and 450 fs 40 (Coulomb Excitation). Uncertainty is the lowest input value. Other value: 970 fs 416 1969Be31.
2787.05 13	2+@	A DEFG JKL	146 fs 35	J π : L=2 in $^{24}\text{Mg}(^3\text{He}, n)$. 2787.5 γ E2 to 0+. T _{1/2} : Other value: 139 fs 111 (1969Be31).
3336.35 22	0+@	DEFG JK	1.52 ps 48	J π : L=0 in $^{24}\text{Mg}(^3\text{He}, n)$. 1539.1 γ E2 to 2+. T _{1/2} : Other value: 1.87 ps 114 (1969Be31).
3757.56 15	(3+)	A DEFG J	<485 fs	J π : Proposed in 2007Se02 from $\gamma(\theta)$ measurements.
3842.2 18	(4+)	A G		E(level): Weighted average of 3842.1 keV 20 (1969Be31) and 3842.2 keV 15 (2004Th09); adopted uncertainty from arithmetic mean. Level not observed in 2007Se02 and its existence considered doubtful based on mirror-nucleus (^{26}Mg) considerations and shell-model calculations. J π : Proposed by 1969Be31 ($^3\text{He}, n\gamma$), based on n- γ correlations and observation of more than one depopulating γ -ray transitions. log ft=6.0 in ^{26}P ϵ decay from (3)+ and also from theoretical predictions (2004Th09).
4139.06 20	2+	A DEFG JKL	35 fs 3	J π : L=2 in ($^3\text{He}, n$). T _{1/2} : Other value: 76 fs 72 (1969Be31).
4187.77 19	(3+)	A DEFG J L		XREF: L(4211). J π : Proposed in 2004Pa42 ($^3\text{He}, n$), from comparison of measured differential cross sections with Hauser-Feshbach predictions. Also in 2007Se02 ($^{16}\text{O}, 2n\gamma$).
4446.37 18	(4+) ^c	DEFG JKL	<350 fs	J π : 2648.7 γ Q to 2+ (both in 2007Se02 ($^{16}\text{O}, 2n\gamma$) and 2015Do07 ($^3\text{He}, n\gamma$)). Other assignment: 2+ in 2004Pa42 ($^3\text{He}, n$) from comparison of measured differential cross sections with Hauser-Feshbach predictions.
4796.9 8	(4+)	DE G J		J π : 2999.4 γ Q to 2+.
4811.0 10	(2+)	DEFG JKL	<69 fs	J π : Proposed in 2004Pa42 ($^3\text{He}, n$), from comparison of measured differential cross sections with Hauser-Feshbach predictions.
4831.2 4	(0+)	E G J		J π : Proposed in 2010Ma43 (p,t), from measured angular distributions and DWBA analysis. Also L=0+(L>0) in ($^3\text{He}, n$) for doublet.
5147.5 8	2+	DEFG JKL		J π : L=2 in (p,t).

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Adopted Levels, Gammas (continued) ^{26}Si Levels (continued)

E(level) [†]	J ^π	XREF	T _{1/2} ^e	Comments
5229? 12	(2+)	J		E(level): Level only observed in 1972Pa02 (p,t). 2010Ma43 (p,t) doubt its existence and claim observation in 1972Pa02 is likely from an overlap of the 5145.7- and 5289.0-keV levels obscured by the tail of the ^{10}C (g.s.) impurity peak at the same position. J π : From shell-model calculations and mirror nuclei considerations (1996Il01).
5289.04 18	4+	DEFG JKL		J π : L=4 in (^3He ,n).
5517.79 23	(4+)	DEFG JKL		J π : L=(4) in (p,t). Also in 2004Pa42 (^3He ,n) from comparison of measured differential cross sections with Hauser-Feshbach predictions. J π =4+ in 2016Ch09 on basis of angular distributions in 2007Se02.
5676.2 3	1+	DEFG J L		$\Gamma_\gamma=1.2\times 10^{-4}$ keV (2009Pe04); other value; $\Gamma_p=1.3\times 10^{-12}$ keV; $\Gamma_\gamma=1.1\times 10^{-4}$ keV (2006Ba65). J π : From comparison of measured differential cross sections with Hauser-Feshbach predictions in 2004Pa42 (^3He ,n). $\Delta J=1$ from angular distribution measurements of γ -ray transitions and feeding of 2+ state (2015Do07 - (^3He ,n γ)).
5890.1 3	0+	G K		J π : Proposed in 2015Do07 (^3He ,n γ), based on isotropic distribution of γ rays and absence of 0- analogue states in ^{26}Al and ^{26}Mg . Also in 2014Ko41.
5929.4 [§] 8	3+ ^c	A F JK		XREF: F(5912)K(5918). E(level): Other values: 5912 keV 4 ((^3He ,n)-2004Pa42), 5916 keV 2 (2006Ba65-(p,t)), and 5918 keV 8 ((α , ^6He) 2008Kw01). 2016Ch09 recommend an excitation energy of 5927.6 keV 10 from weighted average of particle reactions from references mentioned therein. J π : From angular distribution measurements of tritons in smaller angles and comparison with the mirror ^{26}Mg nucleus (2006Ba65 (p,t)). Also 3+ in 2004Pa42 (^3He ,n) and in ^{26}P ϵ decay (2004Th09). Other measurements have generally converged on 3+ assignment (2016Ch09). $\Gamma_p=2.9\times 10^{-3}$ keV 10; $\Gamma_\gamma=9.2\times 10^{-5}$ keV (2009Pe04); other values: $\Gamma_p=2.3\times 10^{-3}$ keV, $\Gamma_\gamma=3.3\times 10^{-5}$ keV (2006Ba65); $\Gamma_\gamma/\Gamma_p=0.014$ 4(stat) +5-4 (literature) based on the beta-delayed proton-decay branching ratio=17.96% 90 through this level (2004Th09), and total absolute γ -decay intensity $I_\gamma=0.25\%$ 7(stat) +8-7(literature) from this level deduced from 1742 γ branching=71% +13-19 from the ^{26}Mg mirror level (2009Wr01). Further using $\Gamma_p=2.9$ eV 10 from 2009Pe04, the deduced $\Gamma_\gamma=40$ meV 11(stat) +19-18 (literature) and the resonance strength $\omega\gamma=23$ meV 6(stat) +11-10 (literature).
5945.9 [‡] 40	(0+) ^{cd}	F J L		E(level): Weighted average of 5946 keV 4 (2004Pa42), 5946 keV 4 (2006Ba65), 5945 keV 8 (2002Ca24), and 5946 keV 4 (2009Pe04). Uncertainty from most precise measurement. 2016Ch09 (a review) adopted a value of 5949.7 keV 53 from literature data mentioned therein. J π : From comparison of measured differential cross sections at two different energies with Hauser-Feshbach predictions in 2004Pa42 (^3He ,n). Shell-model calculations (1996Il01) predict 0+ or 4+ for this state. Mirror-nucleus considerations with ^{26}Mg allow for a 4+ assignment (2016Ch09). However, Hauser-Feshbach calculations in 2004Pa42 rule out a J=4 assignment. $\Gamma_\gamma=5.7\times 10^{-6}$ keV (2009Pe04); other value; $\Gamma_p=1.9\times 10^{-5}$ keV; $\Gamma_\gamma=8.8\times 10^{-6}$ keV (2006Ba65). $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=0.91$ 10 (2010Ch44).
6101		K		

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Adopted Levels, Gammas (continued) ^{26}Si Levels (continued)

E(level) [†]	J $\pi^{\#}$	XREF	T _{1/2} ^e	Comments
6295.3 24	2+	A C F JK		XREF: F(6312). E(level): Weighted average from 6295.7 keV 24 (2010Ma43), 6292 keV 8 (2005ShZY), and 6295 keV 6 (2004Th09). Uncertainty from most precise measurement. J π : L=2 in ($^3\text{He},n$). $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=0.88$ 20 determined from 6300+6380-keV doublet peak in 2010Ch44.
6382.7 29	(2+)	A C F JK		E(level): Weighted average from 6379.5 keV 29 (2010Ma43), 6388 keV 4 (2004Pa42), and 6384 keV 5 (2004Th09). Uncertainty from most precise measurement. J π : L=(2) in (p,t). $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=0.88$ 20 determined from 6300+6380-keV doublet peak in 2010Ch44.
6461.1 28	0+	C F J		E(level): Weighted average of 6456.2 28 (2010Ma43 – (p,t)), 6471 4 (2004Pa42) and 6470 30 (1982Bo14) both from ($^3\text{He},n$). J π : L=0 in ($^3\text{He},n$) 1982Bo14. Measured differential cross sections and Hauser–Feshbach calculations support J π =0+ (2004Pa42).
6765 5		A		
6787 4	3–	C F JK		E(level): Weighted average of 6785 5 (2010Ma43), 6787 4 (2002Ba25), 6786 29 (1972Pa02) from (p,t) and 6788 4 (2004Pa42), 6780 30 (1982Bo14) from ($^3\text{He},n$). J π : L=3 in ($^3\text{He},n$). $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=1.21$ 24 (2010Ch44).
6810 8				K
6880 30	(0+) ^c	C F		E(level): From ($^3\text{He},n$). J π : L=(0) in ($^3\text{He},n$) (1982Bo14). [5+] mirror nucleus assignment in 2010Ma43 (p,t).
7018 6	(3+) ^{&}	C JK		E(level): From 2008Kw01 – ($\alpha,^6\text{He}$). J π : From mirror assignment in 2010Ma43 (p,t). $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=1.04$ 25 (2010Ch44).
7154 4	2+	C F JK	2.7 keV 1	E(level): Weighted average from 7152 keV 4 (2004Pa42), 7151 keV 5 (2010Ma43), 7161 keV 6 (2008Kw01), 7162 keV 24 (2012Ch04), 7147 keV 27 (2014Ju02), 7160 keV 10 (2002Ba25), 7150 keV 30 (1982Bo14), and 7150 keV 15 (1972Pa02). Uncertainty from most precise measurement. J π : L=2 in ($^3\text{He},n$). T _{1/2} : Other value from R-matrix fit in 2012Ch04: 7 keV 4. $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=1.04$ 25 (2010Ch44).
7198 6	(5+) ^{&}	JK		E(level): Weighted average from 7199 keV 6 (2005ShZY) and (tentative) 7197 keV 8 (2010Ma43). Uncertainty from most precise measurement. J π : From mirror assignment in 2010Ma43 (p,t).
7418.4 23	(4+) ^c	C F JK	1.1 keV 1	E(level): Weighted average from 7425 keV 4 (2004Pa42), 7415.2 keV 23 (2010Ma43), 7429 keV 7 (2008Kw01), 7402 keV 45 (2012Ch04), and 7401 keV 28 (2014Ju02). Uncertainty from most precise measurement. J π : From R-matrix analysis and proton–resonance cross sections in 2014Ju02 ($^{25}\text{Al},p$), also in 2010Ma43 (p,t) from DWBA and mirror nucleus assignment. (0+) from L=(0) in 1982Bo14 ($^3\text{He},n$); (2+) from angular-distribution measurements 2002Ba25 (L=2), 2+ from R-matrix analysis and measured differential cross sections (2012Ch04). T _{1/2} : Other value: 6 keV 4 (2012Ch04) – from R-matrix fitting. $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=1.31$ 27 determined from 7425+7498-keV doublet peak in 2010Ch44.
7496.4 40	2+	A C F JK	15.9 keV 3	E(level): Weighted average from 7493 keV 4 (2004Pa42), 7498 keV 4 (2006Ba65), 7480 keV 20 (2008Kw01), 7501 keV 5 (2004Th09), 7484 keV 24 (2012Ch04), and 7484 keV 28 (2014Ju02). Uncertainty – lowest input value. J π : L=2 in ($^3\text{He},n$). T _{1/2} : Other value: 46 keV 11 (2012Ch04) – from R-matrix fitting. $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=1.31$ 27 determined from 7425+7498-keV doublet peak in 2010Ch44.

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Adopted Levels, Gammas (continued) ^{26}Si Levels (continued)

E(level) [†]	J π [#]	XREF		T _{1/2} ^e	Comments
7522 12	(5-)&		J		
7606 6		A			
7674.2 40	(2+)&	C	JK	30.1 keV 5	E(level): Weighted average from 7661 keV 12 (2006Ba65), 7676 keV 4 (2008Kw01), and 7654 keV 29 (2014Ju02). Uncertainty – lowest input value.
7701.1 30	(3-)&	C F	JK	41 keV ^f 6	E(level): Weighted average from 7694 keV 4 (2004Pa42), 7701 keV 12 (2006Ba65), 7705 keV 3 (2005ShZY), and 7704 keV 13 (2012Ch04). Uncertainty – lowest input value. J π : 3- in ($^3\text{He},n$) – 2004Pa42 and mirror assignment [3-] in (2010Ma43) (p,t). But 3+ from R-matrix fit in 2012Ch04 ($^{25}\text{Al},p$). $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=1.18$ 23 (2010Ch44).
7886.2 40	(1-)&	C F	JK	22.8 keV 13	E(level): Weighted average from 7899 keV 4 (2004Pa42), 7886 keV 4 (2008Kw01), 7874 keV 4 (2010Ch44), and 7866 keV 29 (2014Ju02). Uncertainty – lowest input value. $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=1.11$ 22 (2010Ch44).
7921 3			K		
7962 5		A			
8008 14	(3+)	C		4.5 keV 3	E(level): Weighted average from 7977 keV 30 (2014Ju02) and 8015 keV 14 (2012Ch04). Uncertainty – lowest input value. J π : Extracted from R-Matrix fit to experimental cross sections in 2012Ch04. Other assignment: (2+,3+) from R-matrix fit in 2014Ju02. T _{1/2} : Other value: 15 keV 5 (2012Ch04) – from R-matrix fitting.
8144 21	(1-,2+) ^a	A C F			E(level): Weighted average from 8156 keV 21 (2004Th09) and 8120 keV 30 (1982Bo14). Uncertainty – lowest input value. Tentative level at 8166 keV 7 (2010Ch44 – (p,t)) not used in average. J π : mirror assignment as described in 2010Ma43.
8222 5	(1-)&		J		
8254 5		A			
8269 4	(2+)&		J		
8282 6			K		
8356 12	(3+)	C		27 keV 8	J π : From R-matrix fit to proton resonances in $^1\text{H}(^{25}\text{Al},p)$ 2012Ch04.
8431 6			K		
8558 17	(2+)&	A F	JK		E(level): Weighted average from 8557 keV 4 (2010Ma43), 8563 keV 17 (2004Th09), and 8570 keV 30 keV (1982Bo14). Uncertainty from arithmetic mean of associated uncertainties. J π : mirror assignment as described in 2010Ma43. Other value (1-,2+) in 1982Bo14.
8689 21	(1-,2+) ^a	F	J		E(level): Weighted average from 8700 keV 30 (1982Bo14) and 8687 keV 12 (2010Ma43). Uncertainty from arithmetic mean of associated uncertainties. Level was recorded as tentative observation in 2010Ma43. J π : Other: [4+] from mirror assignment described in 2010Ma43.
8806 5			K		
8952 7			K		
8989 7	(4+)&		J		
9067 5			K		
9124? 8			J		
9170 30	(1-,2+) ^a	F			
9247 8			K		
9316 5	(4+) ^b		J		E(level): Mirror state in ^{26}Mg at 9579 keV 3 (1986Al06,2011Ma46).
9373.3 7		A	K		E(level): Weighted average from 9374 keV 7 (2005ShZY) and 9370 keV 15 (2004Th09). Uncertainty from most precise experimental result.
9433 4		A			
9606.1 9	(2+) ^b		JK		E(level): Weighted average from 9605 keV 10 (2011Ma46) and 9607 keV 9 (2005ShZY). Uncertainty from most precise experimental result. Mirror state in ^{26}Mg at 9856.52 keV 6 (1986Al06,2011Ma46).
9725 7		A			
9762 4	(5-) ^b		J		E(level): Mirror state in ^{26}Mg at 10040 keV 2 (1986Al06,2011Ma46).
9802 7			K		

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Adopted Levels, Gammas (continued) ^{26}Si Levels (continued)

E(level) [†]	J π [#]	XREF	Comments
9910.2 20	(0+) ^b	JK	E(level): Mean and adopted uncertainty from arithmetic average of 9903.4 keV 20 (2011Ma46) and 9917 keV 2 (2005ShZY). Mirror state in ^{26}Mg at 10159 keV 3 (1986Al06,2011Ma46).
10070 8		K	
10296.9 60		A K	E(level): Weighted average of 10294 keV 7 (2005ShZY) and 10299 keV 6 (2004Th09). Uncertainty – lowest input value.
10405 5		A J	XREF: J(10436).
10688 9		A J	XREF: J(10660).
10827 8		A J	XREF: J(11010).
13015 4	(3+)	A	T=2. E(level): Highest T=2 level proposed at 13080 keV 15 in 1983Ca06. J π : From ^{26}P ϵ decay (2004Th09).

[†] Up to 5929.4 – from a least-squares fit to γ -ray energies, except for 3842.2–, 5229–, and 5913.8-keV levels. 1763.5 γ from 5517.79-keV level poorly fit to the level scheme and omitted during the fitting procedure and also uncertainty tripled for 988.9 γ from 2787 keV level.

[‡] The existence of this level as a separate resonance is called into question in 2015Do07 due to lack of evidence in their ($^3\text{He},n\gamma$) measurement and also argue that 5946 keV level might be the same level as that at 5929.4 keV. This inference is refuted in 2016Ch09 on the basis of ($^3\text{He},n\gamma$) (2004Pa42) and (p,t) (2010Ma43) measurements that have populated both this resonance and the 5929.4-keV resonance simultaneously.

[§] A value of 5926.9 keV 6 may be obtained from the weighted average of 5927 keV 4 (2010Ch44), 5921 keV 2 (2010Ma43), 5912 keV 4 (2004Pa42), 5916 keV 2 (2002Ba25), 5928.7 keV 7 (2013Be41), 5929 keV 5 (2004Th09), and 5918 keV 8 (2008Kw01). Other values not used in averaging: 5914 keV 2 (200Ba25) and 5914 keV 4 (2009Pe04) for reasons outlined in Sect. IV of 2016Ch09, and 5910 keV 30 (1982Bo14) owing to its large uncertainty overlapping with neighboring resonances. Both the adopted and weighted values are statistically consistent with the suggested value of 5927.6 keV 10 reported in the reanalysis of 2016Ch09.

[#] Taken from 2004Pa42 except where noted. Assignments established by comparison of measured differential cross sections with Hauser-Feshbach calculations.

[@] Deduced from comparison between measured angular distributions and DWBA calculations in 1982Bo14.

[&] Deduced from mirror assignments with ^{26}Mg presented in Fig. 7 in 2010Ma43.

^a Based on comparison of measured angular distributions with DWBA calculations in 1982Bo14.

^b Based on mirror assignments with ^{26}Mg described in 1986Al06 and 2011Ma46.

^c Conflicting spin-parity assignments. See comments.

^d 2002Ca24 argue for a 3+ assignment in ($^3\text{He},^6\text{He}$) on the basis that other 0+ states are only weakly populated in their measurement. However, 2002Ca24 note "a small high energy shoulder on the peak, making it slightly wider at the base, suggests that another state lies there." Evaluators note: It appears that the reported peak at 5945 keV 8 in 2002Ca24 is a doublet of 5929+5946 and the 3+ assignment probably related to the 5929 keV state. 2016Ch09 suggest a similar view for this spin-parity assignment. However, from recent measurements, 2015Do07 ($^3\text{He},n\gamma$) propose the first 0+ state above proton separation energy at 5890 keV and note that there is no theoretical prediction or experimental evidence for T=1 states in analogue nuclei ^{26}Al and ^{26}Mg for two closely spaced 0+ states in this region and the existence of this level as a separate resonance is called into question. However, 2016Ch09 argued that both this level and the 5890.1-keV level may have 0+ assignments due to particle excitations into a different shell and suggest for additional experimental and theoretical work.

^e From ($^3\text{He},n\gamma$), deduced using the Doppler-shift attenuation method except where noted; widths deduced from R-matrix fits to differential cross-sections for $^1\text{H}(^{25}\text{Al},p)$ measured in 2014Ju02 except where noted.

^f Width deduced from R-matrix fits to differential cross-sections for $^1\text{H}(^{25}\text{Al},p)$ measured in 2012Ch04.

 $\gamma(^{26}\text{Si})$

E(level)	E γ [†]	I γ [@]	Mult. ^b	δ ^e	Comments
1797.30	1797.2 1	100	E2		B(E2)(W.u.)=15.3 15. Mult.: Deduced from measured a_2/a_4 anisotropy coefficients from 1797.2 γ to g.s. (2007Se02).
2787.05	988.9 1	100.0 ^{&} 27	M1+E2	+0.21 10	B(M1)(W.u.)=0.100 25; B(E2)(W.u.)=25 24. δ : The other value -3.7(18) (1968Ro18) is rejected in both 1968Ro18 and 1969Be31 on the basis of unlikely transition probability implications.
	2787.0 2	48.9 ^{&} 27	E2		B(E2)(W.u.)=1.7 4. I γ : Others: 67 5 (2015Do07) and 1.35 20 (2014Ko41) both in ($^3\text{He},n\gamma$).
3336.35	549.3 [§]	<2 ^a	c		
	1539.0 2	100 19	E2 ^c		B(E2)(W.u.)=10 5.

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Adopted Levels, Gammas (continued) $\gamma(^{26}\text{Si})$ (continued)

E(level)	$E\gamma^\dagger$	$I\gamma^\oplus$	Mult. ^b	Comments
3757.56	970.5 1	82 4	(M1+E2)	Mult.: From ($^3\text{He},n\gamma$) – 1969Be31. I γ : Others: 47 4 (2014Ko41) and 43 14 (1969Be31) both in ($^3\text{He},n\gamma$).
3842.2	1960.1 2	100 4	(M1+E2)	Mult.: From ($^3\text{He},n\gamma$) – 1969Be31.
	1055.1 §	<15 ^a	c	
	2044.8 §	100 ^a 28		E γ : Measured in γ - γ coincidence (1969Be31). $\Delta I\gamma$: Derived from 2004Th09.
4139.06	802.7 §	<12 ^a		
	1351.5 4	4.9 ^a 8		I γ : From 2014Ko41. Other: 11 5 (2015Do07) both in ($^3\text{He},n\gamma$).
	2341.8 2	100.0 21	M1+E2 ^d	I γ : From 2014Ko41. Other: 100 4 (2015Do07) both in ($^3\text{He},n\gamma$).
	4141 [‡] 3	11.8 59	[E2]	I γ : From 2007Se02 ($^{16}\text{O},2n\gamma$). Other: 25 13 (1969Be31) in ($^3\text{He},n\gamma$). B(E2)(W.u.)=0.28 15.
4187.77	1400.5 2	100.0 59	D	I γ : From 2007Se02 ($^{16}\text{O},2n\gamma$). Other: 61 5 (2015Do07) ($^3\text{He},n\gamma$). Evaluators adopt as the strongest branch along with supporting evidence in 2014Ko41 ($^3\text{He},n\gamma$).
	2390.3 3	57.4 59	D	I γ : From 2007Se02 ($^{16}\text{O},2n\gamma$). Other: 100 5 (2015Do07) ($^3\text{He},n\gamma$). Evaluators adopt this as a weaker branch along with supporting evidence in 2014Ko41 ($^3\text{He},n\gamma$).
4446.37	1658.3 [#] 14	10 5		
	2648.7 2	100.0 22	(E2)	B(E2)(W.u.)>2.3.
4796.9	2999.4 8	100	Q ^d	E γ : Average of data from 2007Se02 ($^{16}\text{O},2n\gamma$), and 2015Do07, 2014Ko41 both in ($^3\text{He},n\gamma$).
4811.0	2023.9 10	100 12	D+Q ^d	E γ : Average of data from 2007Se02 ($^{16}\text{O},2n\gamma$), and 2015Do07, 2014Ko41 both in ($^3\text{He},n\gamma$).
	4810.5 §	<10 ^a		
4831.2	2044.1 3	100		
5147.5	2359.3 [#] 15	100 4	D ^d	
	3350.3 [#] 8	19 5		
5289.04	842.2 2	53 7	D+Q ^d	
	1530.1 10	100 7	D ^d	E γ : Average of data from 2007Se02 ($^{16}\text{O},2n\gamma$), and 2015Do07, 2014Ko41 both in ($^3\text{He},n\gamma$).
5517.79	2501.9 [#] 10	8 9		
	3492.0 [#] 2	43 9	Q ^d	
	1071.6 2	65 11		
	1329.5 3	95 11	D ^d	
	1763.5 8	100 11	D ^d	E γ : Average of data from 2007Se02 ($^{16}\text{O},2n\gamma$), and 2015Do07, 2014Ko41 both in ($^3\text{He},n\gamma$).
5676.2	2733 3	11 14		E γ : From 2007Se02 ($^{16}\text{O},2n\gamma$). Other: 2736.3 10 (2015Do07) ($^3\text{He},n\gamma$) – weak transition.
	2888.9 [#] 9	16 7		
	3878.6 3	100 5	D ^d	
5890.1	1751.9 [#] 10	76 14		
	3103.1 [#] 4	95 14	Q ^d	
	4092.1 [#] 4	100 14	Q ^d	E γ : a γ at 4094 keV 4 was also observed in 1969Be31 and tentatively assigned to deexcite a level at 4094 keV, with additional weaker γ rays. However, this state was not established in subsequent coincidence measurements in 2007Se02 ($^{16}\text{O},2n\gamma$), 2015Do07 ($^3\text{He},n\gamma$), and 2014Ko41 ($^3\text{He},n\gamma$), suggesting it is likely to have been misplaced in 1969Be31.
5929.4	1741.6 7	100		E γ : From ^{26}P ε decay.

[†] Weighted average of data from 2007Se02 ($^{16}\text{O},2n\gamma$), and 2015Do07, 2014Ko41 both in ($^3\text{He},n\gamma$), except where noted. Uncertainty from the most precise measurement.

[‡] From 2007Se02 ($^{16}\text{O},2n\gamma$).

§ From level energy differences, recoil energy subtracted. Placement in 1969Be31 ($^3\text{He},n\gamma$).

[#] From 2015Do07 ($^3\text{He},n\gamma$).

@ From 2015Do07 ($^3\text{He},n\gamma$), except where noted.

& From 2007Se02 ($^{16}\text{O},2n\gamma$).

^a Limits are proposed in Table 4 of 1969Be31, corresponding to the Doppler-shift attenuation measurement (DSAM) for $^{24}\text{Mg}(^3\text{He},n\gamma)$.

^b Inferred from deduced anisotropy coefficients for the angular distributions measured in the fusion-evaporation reaction $^{12}\text{C}(^{16}\text{O},2n\gamma)$ from 2007Se02, except where noted or from $\gamma(\theta)$ measurements in 2015Do07 ($^3\text{He},n\gamma$).

^c From measured gamma-transition widths deduced using Doppler-shift attenuation method for $^{24}\text{Mg}(^3\text{He},n\gamma)$ in 1969Be31.

^d In ($^3\text{He},n\gamma$), assigned by evaluators based on $\gamma(\theta)$ data in 2015Do07 and RUL (if applicable).

^e From $^{24}\text{Mg}(^3\text{He},n\gamma)$, based on n- γ angular-correlation measurements in 1968Ro18.

^{26}P ϵ Decay 2004Th09,2013Be41,1983Ca06

Parent ^{26}P : $E=0.0$; $J\pi=(3)^+$; $T_{1/2}=43.7$ ms 6; $Q(\text{g.s.})=18258$ 90; $\epsilon+\beta^+$ decay=100.

Also: 1984Ca29,1983Ho23,1984CaZV.

2004Th09: Fragmentation of an $^{36}\text{Ar}^{18+}$ beam on a 357.1-mg/cm^2 ^{12}C production target at the GANIL facility was used to produce the ^{26}P isotope. The LISE3 spectrometer was used for fragment separation and the ions of interest were implanted in a stacked silicon detector and identified through their time-of-flight. Measured $E\gamma$, $E(\text{proton})$, $I\gamma$, J^π , $\gamma\gamma$ coincidence, $\beta\gamma$ coincidence, $p\gamma$ coincidence, $p\beta$ coincidence and $T_{1/2}$ with one segmented germanium clover and five stacked silicon detectors. Delayed $\alpha\alpha$ decay branch is energetically possible but no evidence was found.

2013Be41: fast ions of ^{26}P were produced at the National Superconducting Cyclotron Laboratory at the Michigan State University using a 150 MeV/nucleon, 75 pA ^{36}Ar primary beam incident on a 1.55 g/cm^2 Be target. ^{26}P ions were separated from other fragmentation products by magnetic rigidity using the A1900 separator and by the time of flight using a radio-frequency fragment separator. ^{26}P ions were implanted into a 1-cm thick 16-strip by 16-strip planar germanium detector (GeDSSD). Implantations and subsequent beta decays were recorded in the GeDSSD and the γ rays were detected by the SeGA array of Ge detectors in two rings surrounded the GeDSSD. Measured $E\beta$, $E\gamma$, $I\gamma$, $\beta\gamma$ - and $\beta\gamma\gamma$ -coin. Deduced resonance energy, and resonance strength for an important state of astrophysical interest in terms of abundance of ^{26}Al in Milky Way from classical-Nova contribution.

1983Ca06 (also 1984Ca29, 1984CaZV): β^+ -delayed proton decays of ^{26}P produced and identified in $^{28}\text{Si}(^3\text{He},p4n)$ reaction using $E(\text{lab})=110\text{--}130$ MeV beams of intensities $3\text{--}7\text{ }\mu\text{A}$ from the 88-Inch Cyclotron at the Lawrence Berkeley National Laboratory. β^+ -delayed protons measured with 3-element silicon-detector telescope. Measured $E(\text{proton})$, half life, ϵ_{ep} , and $\epsilon_{\text{e}2\text{p}}$.

1983Ho23: β^+ -delayed 2-proton emission observed from decay of ^{26}P produced using the $^{28}\text{Si}(^3\text{He},p4n)^{26}\text{P}$ reaction by bombarding natural silicon target with 110-MeV ^3He beams at the 88-Inch Cyclotron at the Lawrence Berkeley National Laboratory. Recoiling atoms transported into measuring chamber via 70-cm long capillary using helium-jet system. Measured $E(1\text{-proton})$ and $E(2\text{-proton})$ spectra using $\Delta E(14\text{ }\mu\text{m})\text{--}\Delta E(170\text{ }\mu\text{m})\text{--}E(500\text{ }\mu\text{m})$ particle telescope.

 ^{26}Si Levels

$E(\text{level})^\dagger$	$J\pi^\ddagger$	Comments
0.0	0+	T=1.
1797.27 10	2+	
2786.31 14	2+	
3756.95 16	(3+)	
3842.2 15	(4+)	
4139.18 15	2+	
4186.85 25	(3+)	
5928.5 8	(3+)	<p>$E(\text{level})$: 2013Be41 deduced 5928.7 6(stat) 3(syst) 3 (literature) by adding $E\gamma=1741.6$ keV 6(stat) 3(syst) to $E(\text{level})=4187.1$ 3 from 2007Se02. Other value 5929 5 keV (2004Th09).</p> <p>$J\pi$: From 2004Th09.</p> <p>Using $S(p)(^{26}\text{Si})=5513.8$ keV 5 (2012Wa38), 2013Be41 deduced the resonance energy $E_{\text{res}}=414.9$ keV 6(stat) 3(syst) 6 (literature).</p> <p>$\Gamma_\gamma/\Gamma_p=0.014$ 4(stat) +5-4 (literature) based on the beta-delayed proton-decay branching ratio=17.96% 90 through this level (2004Th09), and total absolute γ-decay intensity $I\gamma=0.25\%$ 7(stat) +8-7 (literature) from this level deduced from 1742γ branching=71% +13-19 from the ^{26}Mg mirror level (2009Wr01). Further using $\Gamma_p=2.9$ eV 10 from 2009Pe04, the deduced $\Gamma_\gamma=40$ meV 11(stat) +19-18 (literature) and the resonance strength $\omega\gamma=23$ meV 6(stat) +11-10 (literature).</p>
6295 6	2+	
6384 5	(2+)	
6765 5		
7501 5	2+	
7606 6		
7962 5		
8156 21	(1-, 2+)	
8254 5		
8563 17		
9370 15		
9433 4		
9725 7		
10299 6		
10405 5		
10688 9		
10827 8		
13015 4	(3+)	<p>T=2.</p> <p>$E(\text{level})$: From 2004Th09. Other: 13080 keV 15 in 1983Ca06, highest T=2 level 13300 keV 1000 (stat) 600 (sys) determined in 2015Sc16 from estimated proton decay energy (c.m.) of 5100 keV 1000 (stat) 600 (sys).</p>

† From a least-squares fitting to γ -ray energies.

‡ From Adopted Levels, except otherwise noted.

^{26}P ϵ Decay 2004Th09,2013Be41,1983Ca06 (continued) β^+, ϵ Data

E_ϵ	E(level)	$I\beta^{+\ddagger}$	$I\epsilon^{\ddagger}$	Log ft	$I(\epsilon+\beta^+)^{\ddagger\ddagger}$
(5240 90)	13015	5.3 4	0.0032 3	3.1 1	5.3 4
(7430 90)	10827	0.44 5		5.0 1	0.44 5
(7570 90)	10688	0.24 4		5.4 1	0.24 4
(7850 90)	10405	0.31 6		5.3 1	0.31 6
(7960 90)	10299	0.67 7		5.0 1	0.67 7
(8530 90)	9725	0.59 8		5.2 1	0.59 8
(8830 90)	9433	3.5 2		4.5 1	3.5 2
(8890 100)	9370	0.06 5		6.3 4	0.06 5
(9700 100)	8563	0.27 6		5.9 1	0.27 6
(10000 90)	8254	0.67 7		5.6 1	0.67 7
(10100 100)	8156	0.11 4		6.4 2	0.11 4
(10300 90)	7962	0.99 7		5.5 1	0.99 7
(10650 90)	7606	0.65 6		5.7 1	0.65 6
(10760 90)	7501	2.4 2		5.2 1	2.4 2
(11490 90)	6765	1.5 1		5.5 1	1.5 1
(11870 90)	6384	1.7 2		5.5 1	1.7 2
(11960 90)	6295	0.78 7		5.9 1	0.78 7
(12330 90)	5928.5	18.0 9		4.6 1	18.0 9
(14070 90)	4186.85	2.91 71		5.7 1	2.91 71
(14120 90)	4139.18	1.78 75		5.9 2	1.78 75
(14420 90)	3842.2	1.68 47		6.0 1	1.68 47
(14500 90)	3756.95	2.68 68		5.8 1	2.68 68
(15470 90)	2786.31	3.3 20		5.9 3	3.3 20
(16460 90)	1797.27	44 12		4.9 1	44 12

$\dagger$ Values from Tables 6 and 7 of 2004Th09 are slightly different to those of Figure 13. The total intensity adds to 95% 12. The proton-bound levels ($E < 5929$ keV) account for 56.4% 12 of this intensity.

$\ddagger$ Absolute intensity per 100 decays.

 $\gamma(^{26}\text{Si})$

$E_\gamma^\dagger$	E(level)	$I_\gamma^{\S@}$	Comments
970.5 1	3756.95	1.3 5	E_γ : 972 in 2004Th09.
988.9 1	2786.31	5.2 11	
1400.5 2	4186.85	2.8 7	E_γ : 1400.5 keV 5 in 2004Th09.
1741.6 ‡ 7	5928.5	0.18 $^\#$ 6	E_γ : 1741.6 6(stat) 3(syst) measured by 2013Be41. Absolute $I_\gamma(1742)=0.18\%$ 5(stat) 4(lit.) based on $I_\gamma(1796)=52\%$ 11 from 2004Th09 and $I_\gamma(1742)/I_\gamma(1796)=0.0034$ 9 from the 1742- and 1796-keV peak areas.
1797.2 1	1797.27	52 11	E_γ : 1796 keV forms part of doublet structure with ^{25}Al at 1790 keV (2004Th09).
1960.1 2	3756.95	1.3 3	E_γ : 1960 in 2004Th09.
2044.8	3842.2	1.4 4	E_γ : 2046 in 2004Th09.
2341.8 1	4139.18	1.3 5	E_γ : 2342 in 2004Th09.

$\dagger$ From Adopted Gammas, except otherwise noted.

$\ddagger$ Taken from 2013Be41.

$\S$ Taken from 2004Th09 except where noted.

$\#$ Deduced from 2013Be41.

@ Absolute intensity per 100 decays.

^{26}P ϵ Decay 2004Th09,2013Be41,1983Ca06 (continued) **^{27}S $\beta^+\text{p}$ Decay 2001Ca60**

Parent ^{27}S : $E=0.0$; $J\pi=(5/2+)$; $T_{1/2}=15.5$ ms 15; $Q(\text{g.s.})=16880$ syst; $\%\beta^+\text{p}$ decay=2.3 9.

^{27}S : $Q(\%\beta\text{p})=16880(\text{syst})$ 400(syst) (2012Wa38).

^{26}Si produced in the β -delayed one-proton emission of radioactive ^{27}S via an isobaric analogue state (IAS) in ^{27}P .

Radioactive beam produced by projectile fragmentation of a 2- μA 95-AMeV $^{36}\text{Ar}^{18+}$ beam on a 357-mg/cm² ^{12}C target at the GANIL LISE3 facility. ^{27}S isotopes were separated and implanted in a silicon-detector telescope to measure its half life and main decay branches. Silicon-detector thicknesses were 500 μm , 500 μm , 500 μm , and 6 mm. A germanium clover was also used. Measured β , β - γ , and proton- γ events. Isotopes identified using ΔE -TOF matrix; the ΔE measured in the silicon detectors and the TOF being time of flight between production target and silicon detectors.

2001Ca60 measured an intense proton group with energy 2260 KeV 60, branching 1.9% 4, and decays with 15 ms half life. The proton group was tentatively shown to feed ^{26}Si ground state from an unknown excited state in ^{27}P , however, its branching, 2.3% 9, was not considered to obtain the total ^{27}S $\beta^+\text{p}$ branching in 2001Ca60.

 ^{26}Si Levels

E(level) [†]	$J\pi$
1797.3 1	2+

[†] Taken from Adopted Levels for ^{26}Si in ENSDF database.

Delayed protons

E(p)	E(^{26}Si)	I(p) [†]	E(^{27}P)	Comments
7800 400		61 14	12002	I(p): In 2001Ca60 this one-proton-decay branch is reported with Branching=1.4(5)% and an intensity of 65(20) counts. This branch is reported as a possible one-proton

Continued on next page (footnotes at end of table)

^{27}S $\beta^+\text{p}$ Decay 2001Ca60 (continued)**Delayed protons (continued)**

$E(\text{p})$	$E(^{26}\text{Si})$	$I(\text{p})^\dagger$	$E(^{27}\text{P})$	Comments
10560 400	1797.3	39 14	12002	emission from the IAS in ^{27}P to an excited state in ^{26}Si or to Gamow-Teller-fed transitions beneath the IAS. I(p): In 2001Ca60 this one-proton-decay branch is reported with Branching=0.9(4)% and an intensity of 16(5) counts. This branch is attributed to one-proton emission from the IAS in ^{27}P to the first excited 2^+ state in ^{26}Si at 1797.3 keV.

† For intensity per 100 decays, multiply by 0.023 9.

 $^1\text{H}(^{25}\text{Al},\text{p})$ 2014Ju02,2012Ch04,2005Mo28

$J\pi(^{25}\text{Al})=5/2^+$.

2014Ju02: $E(^{25}\text{Al})=71.58$ MeV 54 radioactive beam of 3.3×10^4 pps was produced via the $^3\text{He}(^{24}\text{Mg},\text{d})$ reaction with the 7.5 MeV/nucleon primary ^{24}Mg beam from the RIKEN AVF cyclotron on ^3He gas target. The secondary beam ions were separated by the Center for Nuclear Study (CNS) Radioactive Ion Beam (CRIB) separator and identified with two parallel plate avalanche counters (PPACs). Target was thick hydrogen gas at a pressure of 330 Torr stored in a cylinder with a 2.5 μm thick Havar foil window for ^{25}Al beam entrance. Scattered protons were detected using $\Delta\text{E-E}$ telescopes of a double-sided 16 $\times$ 16-strip position-sensitive silicon detector as the ΔE detector and two 1500- μm thick single-channel silicon strip detector as the E detectors (SSDs). Measured $\sigma(E_{\text{p}},\theta)$. Deduced resonance energies, widths, $J\pi$ from R-Matrix analysis. Comparison with shell-model calculations and previous measurements.

2012Ch04: a secondary ^{25}Al beam of 1.2×10^6 pps at $E_{\text{lab}}=3.4$ -MeV/nucleon was produced utilizing the reaction $^2\text{H}(^{24}\text{Mg},\text{n})^{25}\text{Al}$ with a 7.5-MeV/nucleon $^{24}\text{Mg}^{8+}$ primary beam from the RIKEN Azimuthally Varying Field (AVF) cyclotron incident upon a cooled ^2H gas target. The ^{25}Al ions were separated using the Center for Nuclear Study (CNS) Radioactive Ion Beam (CRIB) separator and delivered to a target comprising 6.58 mg/cm² of $(\text{C}_2\text{H}_4)_n$. Scattered particles were detected using three sets of $\Delta\text{E-E}$ telescopes each consisting of a double-sided 16 $\times$ 16-strip position-sensitive silicon detector for the ΔE detector and two single-channel silicon- strip detectors for the E detector. Measured $d\sigma/d\Omega(E_{\text{p}},\theta)$. Deduced resonance energies, widths, J^π from R-Matrix analysis. Comparison with shell-model analysis and previous measurements.

2005Mo28: Elastic scattering of ^{25}Al radioactive beam to study resonances above proton threshold in ^{26}Si . Primary ^{24}Mg beam (7.434 MeV/nucleon) bombarded ^3He gas target (0.32 mg/cm²). $E(^{25}\text{Al})(\text{lab})=3.4407$ MeV/nucleon, polyethylene (ch_2) target (8.24 mg/cm²), silicon counter $\Delta\text{E-E}$ telescopes at 0° and 17° used for charged-particle identification and energy measurement. Proton energy spectrum of resonance states above threshold deduced from $^{25}\text{Al} + ^1\text{H}$ excitation function; resonance region covered $E(\text{c.m.})=0.5\text{--}3$ MeV (approx.). See also 2005MOZR, 2005MOZY, 2005MOZZ, and 2004MOZY.

 ^{26}Si Levels

$E(\text{level})^\dagger$	$J\pi^\ddagger$	$\Gamma_{\text{p}}^\ddagger$	$L^\ddagger$	Comments
6300#				
6380#				
6470#				
6787#				
6880#				
7019#				
7147 27	2+	2.7 keV 1	0	$E(\text{p})(\text{c.m.})=1633$ 27; other $E(\text{p})(\text{c.m.})=1648.5$ keV 14 (2012CH04). Resonance strength $\omega\gamma=4.17$ meV. $E(\text{level})$: 7162 24 (2012Ch04). Γ_{p} : 7 keV 4 (2012Ch04).
7401 28	4+	1.1 keV 1	2	$E(\text{p})(\text{c.m.})=1887$ 28; other $E(\text{p})(\text{c.m.})=1888.5$ keV 40 (2012CH04). Resonance strength $\omega\gamma=7.49$ meV. $E(\text{level})$: 7402 45 (2012Ch04). $J\pi$: Other value: 2+ (2012Ch04). Γ_{p} : 6 keV 4 (2012Ch04).
7484 28	2+	15.9 keV 3	0	$E(\text{p})(\text{c.m.})=1970$ 28; other $E(\text{p})(\text{c.m.})=1970.5$ keV 13 (2012CH04). Resonance strength $\omega\gamma=4.17$ meV. $E(\text{level})$: 7484 24 (2012Ch04). Γ_{p} : 46 keV 11 (2012Ch04). L: Other value: L=2 (2002Ba25).

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$^1\text{H}(^{25}\text{Al},\text{p})$ 2014Ju02,2012Ch04,2005Mo28 (continued) **^{26}Si Levels (continued)**

E(level) [†]	$J\pi^{\ddagger}$	$\Gamma_p^{\ddagger}$	$L^{\ddagger}$	Comments
7654 29	(2+, 3+)	30.1 keV 5	0	Γ_p for J=2. $\Gamma_p=19.5$ keV 3 for J=3. E(p)(c.m.)=2140 29; other $E(p)(c.m.)=2190.5$ keV 13 (2012CH04). Resonance strength $\omega\gamma=4.17$ meV.
7704 13	3+ [§]	41 keV [§] 6		
7866 29	1-	22.8 keV 13	1	E(p)(c.m.)=2352 29. Resonance strength $\omega\gamma=129$ meV. E(level): 7900 (2005Mo28).
7977 30	(2+, 3+)	4.5 keV 3	0	Γ_p for J=2. $\Gamma_p=3.6$ keV 2 for J=3. E(p)(c.m.)=2463 30; other $E(p)(c.m.)=2501.5$ keV 14 (2012CH04). Resonance strength $\omega\gamma=5.83$ meV. E(level): 8015 14 (2012Ch04). J π : 3+ (2012Ch04). Γ_p : 15 keV 5 (2012Ch04).
8120 [#]				
8356 12	3+ [§]	27 keV [§] 8		E(p)(c.m.)=2842.5 keV 12.

[†] Deduced by evaluators using E(p)(c.m.) and of S(p)(^{26}Si)=5513.8 keV 5 (2012Wa38), except otherwise noted.

[‡] Extracted from R-Matrix fit to the experimental cross section of proton resonances in 2014Ju02, except where noted.

Uncertainties on Γ_p are statistical only and may be underestimated.

[§] Extracted from R-Matrix fit to the experimental cross section of proton resonances in 2012Ch04. A systematic uncertainty of 20 keV is combined in quadrature to the statistical uncertainty on the level energies listed in Table II of 2012Ch04.

[#] Taken from particle-intensity measurements in 2005Mo28.

 $^1\text{H}(^{27}\text{Si}, ^{26}\text{Si}\gamma)$ 2012Ch18

Also $^{12}\text{C}(^{27}\text{Si}, ^{26}\text{Si}\gamma)$.

An 84.3-MeV/nucleon ^{27}Si beam bombarded a 180-mg/cm² (C₃H₃)_n target at the National Superconducting Cyclotron Laboratory (NSCL). The ^{27}Si secondary beam was produced by fragmentation of a 150-MeV/nucleon $^{36}\text{Ar}^{18+}$ primary beam on a 940-mg/cm² ^9Be target and delivered to the S800 spectrograph using the A1900 fragment separator with an intensity of $\approx 10^6$ pps. Measured energy loss and residual energy of the ^{26}Si recoils using a segmented ionization chamber and plastic scintillator, respectively. The time of flight (TOF) between a diamond strip detector and the plastic scintillator for the ^{26}Si recoils was also measured. γ rays measured with the Segmented Germanium Array (SeGA) comprising 17 high-purity germanium crystals. Measured particle- γ and γ - γ coincidences. Deduced levels and E_γ .

 ^{26}Si Levels

E(level) [†]	$J\pi^{\ddagger}$	E(level) [†]	$J\pi^{\ddagger}$	E(level) [†]	$J\pi^{\ddagger}$
0.0	0+	4135 20	2+	5144 12	2+
1796.1 10	2+	4190 7	3+	5283 6	4+
2785 4	2+	4443 6	4+	5510 8	4+
3329 7	0+	4802 14	4+	5658 20	1+
3753 5	3+	4810 10	(2+)		

[†] From least-squares fit (by evaluators) to E_γ . 1334 γ from the 5510-keV level not used in fit due to poor agreement with level scheme.

[‡] From angular distribution measurements in 2007Se02.

 $\gamma(^{26}\text{Si})$

E_γ	E(level)	Comments
839 4	5283	
968 4	3753	
987 4	2785	
1067 5	5510	
1334 6	5510	E_γ : Poor fit; level-energy difference implies $E_\gamma=1320(11)$ keV.
1405 6	4190	

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$^1\text{H}(^{27}\text{Si}, ^{26}\text{Si}\gamma)$ 2012Ch18 (continued) **$\gamma(^{26}\text{Si})$ (continued)**

$E\gamma$	E(level)	Comments
1533 [†] 7	3329	$E\gamma$: Doublet.
	5283	$E\gamma$: Doublet.
1652 8	4443	
1796	1796.1	$E\gamma$: Used for calibration.
1959 9	3753	
2025 9	4810	
2359 11	5144	
2648 12	4443	
2787 13	2785	
3006 14	4802	
3500 17	5283	
3862 20	5658	
4135 20	4135	

[†] Multiply placed. **$^2\text{H}(^{25}\text{Al}, n)$ 2009Pe04** $J\pi(^{25}\text{Al})=5/2+$.

2009Pe04: Primary ^{24}Mg beam, $E=140$ MeV, bombarded D_2 gas cell to produce ^{25}Al from the reaction $^2\text{H}(^{24}\text{Mg}, n)$ using RESOLUT facility at FSU. The secondary ^{25}Al beam, 67% beam purity, impinged a 1.66-mg/cm^2 CD_2 target at 91.5 MeV using the inverse surrogate reaction for $d(^{25}\text{Al}, n)^{26}\text{Si}$ to infer astrophysical-reaction rates for the nucleosynthesis of $^{25}\text{Al}(p, \gamma)^{26}\text{Si}$. Measured proton-decay spectra from lowest ^{26}Si resonances using a double-sided silicon strip detector. The lowest $l=0$ proton resonance was identified in this experiment.

 ^{26}Si Levels

E(level)	$J\pi$	L	Comments
5676 [†]			$\Gamma_\gamma=1.2\times 10^{-7}$ keV.
5900 1100	3+	0	$E_p=360$ keV 70 (Lab). E(level): Deduced by evaluators using $\text{Sp}(^{26}\text{Si})=5513.8$ keV 5 (2012Wa38) and measured E_p by 2009Pe04. Due to poor resolution, 2009Pe04 could not resolve closely-spaced resonances. However, 2009Pe04 interpreted it to known 396 4 keV resonance instead of other closely-spaced resonances at 412 2 keV and 428 4 keV, based on Hauser-Feshbach calculations. S: A spectroscopic factor of 0.86 30 is inferred from the experimental and theoretical cross sections of 8.7 mb 30 and 10.1 mb, respectively (2009Pe04). $\Gamma_p=2.9\times 10^{-3}$ keV 10; $\Gamma_\gamma=9.2\times 10^{-5}$ keV.
5946 [†]			$\Gamma_p=2.9\times 10^{-3}$ keV 10; $\Gamma_\gamma=9.2\times 10^{-5}$ keV. $\Gamma_\gamma=5.7\times 10^{-6}$ keV.

[†] Quoted from Adopted Levels (rounded to keV) for listing the Γ_γ given by 2009Pe04. The resonance was not measured by 2009Pe04. **$^{12}\text{C}(^{16}\text{O}, 2n\gamma)$ 2007Se02**

2007Se02: Fusion-evaporation reaction $^{12}\text{C}(^{16}\text{O}, 2n)^{26}\text{Si}$, $E(^{16}\text{O})=58$ MeV, stacked $150\text{-}\mu\text{g/cm}^2$ ^{12}C targets, coincidence γ -ray spectroscopy and levels structure of ^{26}Si . γ rays detected using Gammasphere, particles detected using Argonne Fragment Mass Analyzer. Measured γ -ray energies, intensities, anisotropy coefficients, J^π values and multipolarities. Pure $\Delta I=2$ quadrupole transition: $(A_2, A_4)=(+0.357, -0.107)$, pure $\Delta I=\pm 1$ dipole transition: $(A_2, A_4)=(-0.25, 0)$, and pure $\Delta I=0$ dipole transition: $(A_2, A_4)=(+0.5, 0)$.

 ^{26}Si Levels

E(level) [†]	$J\pi^\ddagger$
0.0	0+
1797.30 10	2+
2786.58 19	2+

Continued on next page (footnotes at end of table)

$^{12}\text{C}(^{16}\text{O},2n\gamma)$ 2007Se02 (continued) **^{26}Si Levels (continued)**

$E(\text{level})^\dagger$	$J\pi^\ddagger$	$E(\text{level})^\dagger$	$J\pi^\ddagger$	$E(\text{level})^\dagger$	$J\pi^\ddagger$
3336.4 5	0+	4446.1 3	4+	5147.1 8	2+
3757.03 20	3+	4798.5 5	4+	5288.2 4	4+
4139.6 6	2+	4810.9 6	(2+)	5517.8 4	4+
4188.1 3	3+	4831.6 10	(0+)	5677.0 17	1+

† From least-squares fit to E_γ data by evaluators. The uncertainties of the following E_γ transitions were doubled (during fitting only) to generate an acceptable fit for a reduced $\chi^2=2.24$ which compares well with the critical value of 2.13: 988.8, 1400.7, 1764.4, 1960.4, and 2787.5 keV. Using the uncertainties given in 2007Se02 gives a reduced $\chi^2=6.56$.

‡ Proposed in 2007Se02 based on angular distribution measurements.

 $\gamma(^{26}\text{Si})$

E_γ	$E(\text{level})$	I_γ	Mult. ‡	Comments
842.1 3	5288.2	3.6 4		
970.4 1	3757.03	8.1 4	D	$A_2=-0.30$ 9; $A_4=+0.07$ 11.
988.8 † 1	2786.58	26.4 7	D	$A_2=+0.14$ 5; $A_4=+0.01$ 7.
1071.8 4	5517.8	2.9 4		
1329.4 3	5517.8	3.9 4		
1355 2	4139.6			
1400.7 † 2	4188.1	10.1 6	D	$A_2=+0.41$ 13; $A_4=+0.09$ 15.
1531.1 5	5288.2	4.8 5		
1539.1 5	3336.4	2.6 5		
1657 2	4446.1			
1764.4 † 8	5517.8	4.0 7		
1797.2 1	1797.30	100.0 15	Q	$A_2=+0.18$ 4; $A_4=-0.08$ 4.
1960.4 † 2	3757.03	10.6 6	D	$A_2=-0.15$ 11; $A_4=+0.01$ 15.
2024.2 5	4810.9	4.3 5		
2044.9 9	4831.6	1.2 4		
2341.9 6	4139.6	6.8 6		
2360.2 8	5147.1	3.6 5	D	$A_2=+0.42$ 24; $A_4=+0.17$ 26.
2391.4 5	4188.1	5.8 6	D	$A_2=+0.52$ 18; $A_4=+0.20$ 20.
2503 2	5288.2			
2648.8 3	4446.1	17.3 8	Q	$A_2=+0.32$ 11; $A_4=-0.15$ 13.
2733 3	5517.8			
2787.5 † 3	2786.58	12.9 7	Q	$A_2=+0.36$ 12; $A_4=-0.22$ 14.
3001.0 4	4798.5	12.4 8		$A_2=+0.12$ 11; $A_4=-0.37$ 14.
3351 2	5147.1			
3879.4 17	5677.0	1.4 4		
4141 3	4139.6	0.8 4		

† Uncertainty doubled by evaluators only during the least-squares fitting procedure.

‡ Multipolarity assignments based on anisotropy coefficients and discussion in 2007Se02.

 $^{24}\text{Mg}(^3\text{He},n)$ 2004Pa42,1986Al15,1982Bo14

Others: 1973De33,1974Ab03,1975Ha21,1980Wi13.

2004Pa42: $^{24}\text{Mg}(^3\text{He},n)^{26}\text{Si}$, 4.5 MV Van de Graaff tandem accelerator, enriched (99.9%) ^{24}Mg target (26 $\mu\text{g}/\text{cm}^2$), liquid scintillators (two BC501A and one NE213) for neutron detection. $E(^3\text{He})=7.9$ at 0° , 8.11 at 60° , and 10.0 MeV at 0° .

Measured neutron-energy spectra using liquid scintillators in tof arrangement. J^π assignments established by comparison of measured differential cross sections with Hauser-Feshbach predictions. Deduced reaction rates for $^{25}\text{Al}(p,\gamma)^{26}\text{Si}$.

1986Al15: Measurement using University of Colorado neutron time-of-flight facility. ^3He beam $E(\text{lab})=25.4$ MeV, ^{24}Mg rolled target (99% enriched) thickness=1.3 mg/cm^2 . Neutrons detected in three counters comprising Ne 224 liquid scintillators mounted on RCA 4522 photomultipliers. Pulse-shape discrimination of neutron and gamma signals.

Angular distributions, DWBA analysis, J^π assignments, angular momentum L-transfer values, shell-model analysis.

1982Bo14: Neutron time-of-flight measurement. ^3He $E(\text{lab})=13$ MeV, ^{24}Mg (99.96% enriched) target 122 $\mu\text{g}/\text{cm}^2$ on thick tungsten backing. Angular distributions and DWBA calculations, J^π and angular momentum L-transfer values extracted. Shell-model analysis.

$^{24}\text{Mg}(^3\text{He},n)$ 2004Pa42,1986Al15,1982Bo14 (continued) **^{26}Si Levels**

E(level) [†]	J π^a	L [#]	Comments
0.0 [‡]	0 ⁺ ^b	0	
1795.9 [‡]	2 ⁺ ^b	2	
2783.5 [‡]	2 ⁺ ^b	2	
3332 [‡]	0 ⁺ ^b	0	
3756 [‡]			
4138 ⁴	2 ⁺	2	
4183 ⁴	3 ⁺		
4446 [‡]	2 ⁺		J π : Conflicting assignment. See comments in Adopted Levels.
4806 [‡]	(2 ⁺)	2 [@]	L: Fit as a doublet corresponding to a DWBA calculation requiring L=0+(J>0) in 1982Bo14.
5145 ⁴	2 ⁺		
5291 ⁴	4 ⁺	4	
5515 ⁴	4 ⁺		
5670 ⁴	1 ⁺		
5912 ⁴	3 ⁺	0+(4)	
5946 ⁴	0 ⁺		J π : (3 ⁺) in Adopted Levels.
6312 ⁴	2 ⁺	2	
6388 ⁴	2 ⁺		
6471 ⁴	0 ⁺	0	
6788 ⁴	3 ⁻	3 [@]	L: Other value L=0+2 from fitting 6780(30)+6880(30)-keV region in 1982Bo14.
6880 ^{§ 30}	(0 ⁺)	(0)	L: Obtained from fitting both 6780(30)+6880(30)-keV region in 1982Bo14.
7152 ⁴	2 ⁺	2	
7425 ⁴	0 ⁺	(0)	J π : Conflicting assignment. See comments in Adopted Levels.
7493 ⁴	2 ⁺	2	
7694 ⁴	3 ⁻		
7899 ⁴	1 ⁻		
8120 ^{§ 30}	(1 ⁻ , 2 ⁺) ^b	2 ^{&}	
8570 ^{§ 30}	(1 ⁻ , 2 ⁺) ^b	2 ^{&}	
8700 ^{§ 30}	(1 ⁻ , 2 ⁺) ^b	2 ^{&}	
9170 ^{§ 30}	(1 ⁻ , 2 ⁺) ^b	2 ^{&}	

[†] Taken from 2004Pa42 except where noted.[‡] These levels were observed and used for calibration in 2004Pa42; the adopted energies were taken from 1982Bo14.[§] Taken from 1982Bo14.[#] l-transfer value taken from angular-distribution measurements in 1982Bo14 except where noted.[@] l-transfer value taken from angular-distribution measurements in 1986Al15.[&] DWBA calculations in 1982Bo14 also support L=1.^a Assignments from measured differential cross sections and comparison with Hauser-Feshbach calculations in 2004Pa42 except where noted.^b Deduced from comparison between measured angular distributions and DWBA analysis in 1982Bo14. **$^{24}\text{Mg}(^3\text{He},n\gamma)$ 2015Do07,2014Ko41,1969Be31**

Others: 1960Ro06,1963Fr10,1968Ro18,1971Mo27,1972Ha58,1982Al15.

2015Do07: ^3He beam, E=10 MeV, from ATLAS accelerator at ANL bombarded a ^{24}Mg target (thickness ~840 $\mu\text{g}/\text{cm}^2$); γ -rays detected with almost 4π coverage using Gammasphere array; Measured $E\gamma$, $I\gamma$, $\gamma\gamma$ coincidence, $\gamma(0)$, deduce level scheme, angular distribution coefficients, spin-parity.2014Ko41: E(^3He)=10 MeV. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$ -coin, $n\gamma$ -coin, $\gamma(0)$, $\gamma\gamma(0)$ (DCO) using three large HPGe detectors at Tsukuba accelerator UTTAC. Deduced levels, J, π , proton resonances. Comparison with previous experimental results.Based on proton resonances studied in this work, deduced astrophysical reaction rates for $^{25}\text{Al}(p,\gamma)^{26}\text{Si}$.1982Al15: $^3\text{He}(^{24}\text{Mg},n\gamma)$ inverse reaction used to produce ^{26}Si recoils and analyze Doppler-broadened γ -ray lineshapes to extract mean lifetimes. Target prepared by implanting 35-keV ^3He ions into 250 μm Au backings to a dose of 6×10^{17} $^3\text{He}/\text{cm}^2$. Data accumulated over five days running with $^{24}\text{Mg}^{6+}$ beam at E(lab)=50 MeV. Neutrons detected with two NE213 liquid scintillators and γ rays detected with three Ge(Li) detectors.1969Be31: Deduced excitation energies, γ -ray intensities, lifetimes, J π , and branching ratios in ^{26}Si using the Doppler-shift attenuation method. Results compared to shell-model calculations. Measurements carried out using a ^3He beam at E(lab)=5.5, 7.8, and 10.0 MeV from the Oxford University Van de Graff accelerator. Enriched (99.8%) ^{24}Mg self-supporting target (3 mg/cm^2). Measured n- γ angular correlations using Ge(Li) and NaI(Tl) counters, NE213 liquid scintillator and XP1040 photomultiplier.

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$^{24}\text{Mg}(^3\text{He}, n\gamma)$ 2015Do07, 2014Ko41, 1969Be31 (continued)

- 1968Ro18: $^{24}\text{Mg}(^3\text{He}, n\gamma)^{26}\text{Si}$ reaction used to study $n\text{-}\gamma$ coincidences at ^3He beam (intensity 0.1 μA) energies $E(\text{lab})=6.0, 7.0$, and 7.3 MeV using a 5.5 MV Van de Graaff accelerator. Enriched (99.9%) ^{24}Mg target (thickness 200 $\mu\text{g}/\text{cm}^2$) on thick tantalum backing. Coincidence $n\text{-}\gamma$ angular correlations and $\gamma\text{-}\gamma$ spectroscopy using NaI(Tl) crystals and NE213 liquid scintillators. Deduced ^{26}Si energy levels, γ -ray intensities, J^π , and $\delta(\text{M1/E2})$ mixing ratios.
- 1960Ro06: Half-life measurement using a pneumatic-transfer system (transit time 0.25 s) to transport activated samples to a NaI(Tl) scintillator. An 8-MeV ^3He beam provided by the Purdue University 37-inch cyclotron was used to bombard a series of four rabbit-interchangeable 3/4-inch diameter by 3/8-inch height vacuum-distilled natural magnesium targets. Measured ^{26}Si half life.
- 1963Fr10: Van de Graff accelerator provides 5.5-MeV ^3He beam to bombard 5 mg/cm^2 foil of natural magnesium. A Siegbahn-Slätis intermediate- image focusing spectrometer was used. Delayed γ rays were measured using NaI scintillator mounted onto a photomultiplier tube. Measured ^{26}Si half life.
- 1971Mo27: A 16-MeV $^3\text{He}^+$ ion beam from University of Colorado cyclotron is delivered to a thick natural magnesium target. The decay products are transported a distance 5 m to a low-background facility using a pneumatic-transfer shuttle (transit time 0.3 s). β -delayed γ rays measured using 25 cm^3 Ge(Li) detector. Deduced $\log ft$ values. Measured ^{26}Si half life.
- 1972Ha58: ^{26}Si half-life measurement by irradiating a thick ^{24}Mg foil with a 12-MeV ^3He beam using the Chalk River MP tandem. Recoiling ^{26}Si atoms were stopped in a hydrogen gas cell behind the target cell and periodically swept by helium gas to a counting cell 4 m away. The transit time was about 50 ms. The counting cell was viewed by a Ge(Li) detector and ^{26}Si half life was deduced by analyzing the γ -decay spectra. Branching ratios determined by comparison of γ -decay intensities to 511-keV annihilation peak from positrons.

 ^{26}Si Levels

$E(\text{level})^\dagger$	$J^\pi^\S$	$T_{1/2}^\&$	Comments
0.0	0+		
1797.31 9	2+	430 fs 42	$T_{1/2}$: Other value: 970 fs 416 1969Be31.
2786.60 11	2+	146 fs 35	$T_{1/2}$: Other value 139 fs 111 1969Be31.
3336.46 22	0+	1.52 ps 48	$T_{1/2}$: Deduced from mean lifetime 2000 fs +900-500. Other value: 1.87 ps 114 (1969Be31).
3757.23 14	3+	<485 fs ^a	
3843.47 [‡] 20	(4+) [#]		J^π : From 1969Be31, based on $n\text{-}\gamma$ correlations and observation of more than one of γ -ray transitions. 1968Ro18 proposed 3(+) from $n\text{-}\gamma$ angular correlations of 2046 γ .
4094? [‡] 4	(1, 2) [@]		$E(\text{level})$: Level apparent only from its ground-state branch in 1969Be31 and cannot be considered absolutely established. Level not reported in coincidence measurements 2014Ko41 and 2015Do07 and not adopted by evaluators. A γ at 4092 keV is reported to deexcite the 5890-keV state in 2014Ko41 and 2015Do07, suggesting the 4094-keV γ in 1969Be31 was misplaced and it is likely the 4094-keV level does not exist.
			J^π : Assignment tentatively deduced on the basis of ground-state transition in 1969Be31.
4139.15 22	2+	35 fs 3	$T_{1/2}$: Other value 76 fs 72 1969Be31.
4187.38 18	3+		
4446.43 17	4+	<350 fs ^a	
4796.6 4	4+		
4812.1 4	(2+)	<69 fs ^a	
4832.3 7	(0+)		
5147.6 4	2+		
5289.05 17	4+		
5517.53 22	4+		$E(\text{p})(\text{res})=4.7$ keV. $E(\text{level})$: Excitation energy not established firmly. Poor fit of γ rays in the decay scheme.
5676.3 3	1+		$E(\text{p})(\text{Lab})=160.4$ keV.
5889.9 3	0+		$E(\text{p})(\text{Lab})=377.2$ keV. J^π : proposed in 2015Do07, based on isotropic distribution of γ rays and absence of 0- analogue states in ^{26}Al and ^{26}Mg .

[†] From a least-squares fit to γ -ray energies. The 1764.2- and 2736.3-keV γ rays from 5517 level fit poorly. These were omitted from the fitting procedure.

[‡] Tentative level in 1969Be31.

[§] Deduced from angular correlations in 2014Ko41 except where noted.

[#] Deduced from $n\text{-}\gamma$ angular correlations in 1968Ro18.

[@] Deduced from angular distributions in 1969Be31.

[&] Deduced from Doppler-broadened γ -ray lineshapes in 1982Al15, except where noted.

^a Deduced from Doppler-broadened γ -ray lineshapes in 1969Be31.

$^{24}\text{Mg}(^3\text{He},n\gamma)$ 2015Do07,2014Ko41,1969Be31 (continued) $\gamma(^{26}\text{Si})$ S(p)(^{26}Si)=5513.8 5 (2012Wa38).DCO values (2014Ko41) are for 90° and 135° geometry, gated on 1797.4 γ from first 2+ to g.s., and further normalized to that for 988.8 γ -1797.4 γ 2+ $\rightarrow$ 2+ $\rightarrow$ 0+ cascade, with $\delta(988.8\gamma)=-0.21$ 10 taken from literature (1968Ro18).

$E\gamma^\dagger$	E(level)	$I\gamma^\dagger$	Mult.&	δ^b	Comments
549.9#	3336.46		E2		I γ : Reported as <2% branch cf. the strongest γ at 1537.9 keV in 1969Be31.
757.5#c	4094?				I γ : Reported as <30% branch cf. the strongest γ at 4093 keV in 1969Be31.
802.7#	4139.15				I γ : Reported as <10% the branch intensity in 1969Be31.
842.5\$@ 1	5289.05	26 3	D+Q ^a		A ₂ =+0.10 3; A ₄ =+0.01 4 (2015Do07). E γ ,I γ : Other: 840.4 7 and 3.2 1 (2014Ko41).
970.6 1	3757.23	45 2	M1+E2		A ₂ =-0.25 1; A ₄ =0.00 1 (2015Do07).
989.1 1	2786.60	60 2	M1+E2	+0.21 10	E γ ,I γ : Other: 970.3 4 and 4.3 3, respectively (2014Ko41). DCO=0.88 1 (2014Ko41). A ₂ =+0.17 4; A ₄ =-0.04 3 (2015Do07).
1056.8#c	3843.4?				E γ ,I γ : Other: 988.8 5 and 52.0 5, respectively (2014Ko41). I γ : Reported as <15% branch cf. the strongest γ at 2046 keV in 1969Be31.
1071.4 2	5517.53	24 4			E γ ,I γ : Other: 1071.9 4 and 1.6 1, respectively (2014Ko41).
1307.4#c	4094?				I γ : Reported as <40% branch cf. the strongest γ at 4093 keV in 1969Be31.
1329.4 3	5517.53	35 4	D ^a		A ₂ =-0.09 5; A ₄ =+0.01 4 (2015Do07).
1351.9 12	4139.15	9 4			E γ ,I γ : Other: 1330.0 4 and 1.4 2, respectively (2014Ko41).
1400.4 2	4187.38	38 3	D ^a		E γ ,I γ : Other: 1351.3 4 and 1.2 2, respectively (2014Ko41). A ₂ =-0.14 4; A ₄ =+0.03 4 (2015Do07).
1475.6#	4812.1				E γ ,I γ : Other: 1400.5 4 and 5.5 3, respectively (2014Ko41).
1531.1\$@ 6	5289.05	49 3	D ^a		I γ : Reported as <20% the branch intensity in 1969Be31. A ₂ =-0.09 2; A ₄ =-0.02 3 (2015Do07).
1539.1 2	3336.46	100	E2		E γ ,I γ : Other: 1528.2 4 and 1.2 4 (2014Ko41). DCO=0.48 (2014Ko41). A ₂ =+0.05 4; A ₄ =+0.02 3 (2015Do07).
1658.3\$ 14	4446.43	9 4			E γ : Other: 1537.9 4 and 40.2 5, respectively (2014Ko41).
1751.9\$ 10	5889.9	28 5			
1764.2 4	5517.53	37 4	D ^a		A ₂ =-0.08 4; A ₄ =-0.02 3 (2015Do07). E γ : level-energy difference=1761.1 3. E γ ,I γ : Others: 1762.0 4 and 1.7 1, respectively (2014Ko41); 1765 3 (1969Be31).
1797.2 1	1797.31	100	E2		A ₂ =+0.33 1; A ₄ =-0.10 2 (2015Do07).
1959.8 2	3757.23	55 2	M1+E2		E γ ,I γ : Other: 1797.4 4 and 100.0 10, respectively (2014Ko41). DCO=1.12 7 (2014Ko41). A ₂ =-0.16 2; A ₄ =+0.01 2 (2015Do07).
2025.4\$@ 3	4812.1	100	D+Q ^a		E γ ,I γ : Other: 1959.9 4 and 9.2 3, respectively (2014Ko41). $\Gamma_\gamma > 4.6 \times 10^{-6}$ keV (1969Be31). A ₂ =+0.09 2; A ₄ =+0.02 3 (2015Do07).
2045.6\$@ 7	4832.3	100			E γ : Other: 2022.0 4 and 8.9 4 (2014Ko41).
2046\$@c 2	3843.4?		(M1+E2)	-4.7 20	E γ ,I γ : Other: 2043.7 3 and 3.7 3 (2014Ko41). I γ : Reported as the 100% branch in 1969Be31. Mult.: Reported as E2 in 1969Be31, evaluators assign (M1+E2) based on reported mixing ratio in 1968Ro18. δ : -4.7 20 in 1968Ro18 proposing the transition from 3(+) to 2+. 1969Be31 propose this transition as E2 from (4+) to 2+. See comments for spin and parity.
2296.6#c	4094?				I γ : Reported as <20% branch cf. the strongest γ at 4093 keV in 1969Be31.
2341.8 2	4139.15	81 4	D+Q ^a		DCO=0.63 2 (2014Ko41). A ₂ =+0.14 2; A ₄ =+0.02 3 (2015Do07).
2359.3\$@ 15	5147.6	84 3	D+Q ^a		E γ ,I γ : Other: 2341.6 4 and 24.7 5, respectively (2014Ko41). $\Gamma_\gamma > 2.4 \times 10^{-6}$ keV (1969Be31). A ₂ =+0.11 4; A ₄ =-0.02 5 (2015Do07). E γ : Average of 2360.8 4 (2015Do07) and 2357.7 2 (2014Ko41). I γ : Other: 2357.7 2 and 4.6 2 (2014Ko41).

Continued on next page (footnotes at end of table)

$^{24}\text{Mg}(^3\text{He},n\gamma)$ 2015Do07,2014Ko41,1969Be31 (continued) $\gamma(^{26}\text{Si})$ (continued)

$E\gamma^\dagger$	E(level)	$I\gamma^\dagger$	Mult.&	Comments
2390.0 3	4187.38	62 3	D ^a	DCO=0.79 7 (2014Ko41). A ₂ =-0.19 6; A ₄ =+0.01 5 (2015Do07). E γ ,I γ : Other: 2390.0 4 and 4.4 2, respectively (2014Ko41).
2501.9 [‡] 10	5289.05	4 4		
2648.9 2	4446.43	91 2	Q ^a	DCO=1.24 7 (2014Ko41). A ₂ =+0.21 4; A ₄ =-0.09 4 (2015Do07). E γ ,I γ : Other: 2647.8 4 and 10.6 4 (2014Ko41). $\Gamma_\gamma > 1.3 \times 10^{-6}$ keV (1969Be31). E γ : poor fit in the level scheme. Level-energy difference=2730.8 2. A ₂ =+0.24 2; A ₄ =-0.08 3 (2015Do07). E γ ,I γ : Other: 2787.4 4 and 0.7 1, respectively (2014Ko41).
2736.3 [‡] 10	5517.53	4 5		
2786.6 2	2786.60	40 3	E2	
2888.9 [‡] 9	5676.3	14 6		
2999.1 3	4796.6	100	Q	DCO=0.98 6 (2014Ko41). A ₂ =+0.16 5; A ₄ =-0.05 4 (2015Do07). E γ : Other: 2998.2 4 and 6.4 3, respectively (2014Ko41). I γ : Reported as a 30% 10 branch in 1969Be31. $\Gamma_\gamma > 2 \times 10^{-6}$ keV (1969Be31).
3014.6 [#]	4812.1			A ₂ =+0.06 4; A ₄ =-0.04 4 (2015Do07). E γ : Average of 3103.0 4 (2015Do07) and 3103.7 6 (2014Ko41). I γ : Other: 1.6 2 (2014Ko41).
3103.1 4	5889.9	35 5	Q	
3350.3 [‡] 8	5147.6	16 4		
3492.0 ^{‡‡} 2	5289.05	21 4	Q ^a	A ₂ =+0.12 3; A ₄ =-0.08 2 (2015Do07).
3878.8 3	5676.3	86 4	D ^a	DCO=0.94 11 (2014Ko41). A ₂ =-0.07 3; A ₄ =-0.01 2 (2015Do07). E γ ,I γ : Other: 3876.2 10 8.8 3 and 2.6 2, respectively (2014Ko41).
4092.1 4	5889.9	37 5	Q	DCO=0.55 11 (2014Ko41). A ₂ =+0.03 2; A ₄ =-0.02 2 (2015Do07). E γ ,I γ : Other: 4092.2 10 and 2.1 2, respectively (2014Ko41).
4094 ^{§@c} 4	4094?			E γ : Evaluators believe this E γ is the same as the 4092-keV γ that depopulates the 5889.9-keV level. I γ : Reported as the 100% branch in 1969Be31.
4135 ^{§@} 6	4139.15			$\Gamma_\gamma > 6 \times 10^{-7}$ keV (1969Be31). I γ : Reported as a 20% 10 branch in 1969Be31.
4811.6 [#]	4812.1			I γ : Reported as <10% the branch intensity in 1969Be31.

[†] From 2015Do07, except where noted. E γ from 2014Ko41 listed in comments section.[‡] Reported only in 2015Do07.[§] Reported energy in 2014Ko41 significantly lower compared to value in 2015Do07.[#] Calculated from level energy difference, recoil energy subtracted. γ transition from 1969Be31 (energy not listed).[@] From 1969Be31.[&] From angular distribution measurements in 1969Be31, except otherwise noted.^a From $\gamma(\theta)$ data in 2015Do07, assigned by evaluators.^b Deduced from n- γ angular correlations in 1968Ro18.^c Placement of transition in the level scheme is uncertain.**Coulomb Excitation 2001Co20**

Intermediate-energy Coulomb excitation of ^{26}Si . Primary ^{36}Ar beam (E=100 MeV/nucleon) fragmented on ^9Be target (564 mg/cm²). Secondary radioactive ^{26}Si beam (E=54.5 MeV/nucleon) on ^{197}Au target (518 mg/cm²). Coincidence γ -ray spectroscopy with ^{26}Si . Measured B(E2).

 ^{26}Si Levels

E(level) [†]	J $\pi^\dagger$	T _{1/2}	Comments
0.0	0+		
1797.3 1	2+	450 fs 40	B(E2) [†] =0.0336 33. T _{1/2} : Deduced by evaluators using B(E2) value and 1795.9 γ adopted properties.

[†] From Adopted Levels.

Coulomb Excitation 2001Co20 (continued) $\gamma(^{26}\text{Si})$

$E\gamma$	E(level)	Mult.	Comments
1795.9	1797.3	E2	B(E2) $\downarrow$ =0.00672 66.

 $^{28}\text{Si}(\text{p},\text{p}2\text{n}\gamma)$ 2004Va22

Measured production cross section for the $2^+_{1-} \rightarrow 0^+_{\text{gs}}$ at 1796.0 γ transition. Produced in the spallation reaction $^{28}\text{Si}(\text{p},\text{p}2\text{n})^{26}\text{Si}$. E=1.1 GeV protons, natural Si target, Ge(Li)-NaI(Tl) anti-coincidence γ -ray spectroscopy.

 ^{26}Si Levels

E(level) †	$J\pi^\dagger$
0.0	0+
1797.3 1	2+

† From Adopted Levels.

 $\gamma(^{26}\text{Si})$

$E\gamma$	E(level)	Comments
1796.0 9	1797.3	σ =1.4 mb 9 (2004Va22). Compares well with previous result of 1.4 mb 1 in 1990We14.

 $^{28}\text{Si}(\text{p},\text{t})$ 2010Ma43,2011Ma46,2002Ba25

Others: 1970Ne17,1972Pa02,1985Mi06,1996Ii01,2005Pa31,2006Ba65,2007ClZZ, 2010Ch44.

2010Ma43: Two-neutron pick-up experiment performed at the high-resolution Grand Raiden (GR) spectrometer at the Research Center for Nuclear Physics. Proton beam energy E(lab)=98.7 MeV from the Ring Cyclotron facility incident upon ^{28}Si self-supporting target (99.94% enrichment) with an areal density of 0.7 mg/cm². Measured energy levels in ^{26}Si according to momentum analysis of the outgoing tritons detected using the GR spectrometer. Single-particle spectroscopic factors compared to previous work. Measured angular distributions and DWBA analysis.

2011Ma46: Resonance levels in ^{26}Si observed above the α -emission threshold at 9.164 MeV. ^{26}Si events produced using a 98.7-MeV proton beam from the Ring Cyclotron facility of the Research Center for Nuclear Physics (RCNP) at Osaka University, and impinging a 3-foil- stacked ^{28}Si self-supporting target of thickness 0.7 mg/cm². The outgoing tritons were momentum analyzed by the Grand Raiden (GR) spectrometer. Measured angular distributions. Deduced energy levels, J^π , and α spectroscopic factors. Reaction rates deduced for $^{22}\text{Mg}(\alpha,\text{p})^{26}\text{Al}$.

2002Ba25,2006Ba65: Measured differential cross sections for the $^{28}\text{Si}(\text{p},\text{t})^{26}\text{Si}$ reaction to study the $^{25}\text{Al}(\text{p},\gamma)^{26}\text{Si}$ reaction rate in novae. E(p)=40,42 MeV, 50 $\mu\text{g}/\text{cm}^2$ natural silicon target. Measured triton spectra using silicon detector array, ΔE -E energy-loss techniques, angular distributions, L-transfer and J^π assignments. See also 2003Ba85.

2010Ch44: Measured triton energy spectra and angular distributions using SIDAR, a segmented annular array of silicon detectors. A 40-MeV proton beam was delivered from the ORNL Holifield Radioactive Ion Beam facility incident on a 200- $\mu\text{g}/\text{cm}^2$ ^{nat}Si target. Measured proton-triton coincidences, deduced levels, J^π assignments and proton-decay branching ratios. DWBA analysis of $\sigma(\theta)$ data. Astrophysical relevance to the reaction rates for $^{25}\text{Al}(\text{p},\gamma)$ inferred.

1972Pa02: $^{28}\text{Si}(\text{p},\text{t})^{26}\text{Si}$, E=40-45 MeV. Deduced energy levels, J^π assignments, L-transfer measurements. Two-nucleon distorted-wave calculations compared to experimental angular distributions.

2005Pa31: Measured Q values of the reactions $^{28}\text{Si}(\text{p},\text{t})^{26}\text{Si}$, $^{24}\text{Mg}(\text{p},\text{t})^{22}\text{Mg}$ relative to that of $^{16}\text{O}(\text{p},\text{t})^{14}\text{O}$ using 33-MeV proton beam. Backed 65 $\mu\text{g}/\text{cm}^2$ ^{28}SiO and 67 $\mu\text{g}/\text{cm}^2$ ^{24}MgO targets. Measured triton-momentum spectra at angles of 15° and 25°. Deduced mass excess of ^{26}Si ΔM =-7139.5 keV 10.

2007ClZZ: $^{28}\text{Si}(\text{p},\text{t})^{26}\text{Si}$ reaction used to measure mass of ^{26}Si with the Yale spectrograph. Experiment performed using the Van de Graaff accelerator at Yale University. E(lab)=33 MeV proton beam incident upon ^{28}SiO (65 $\mu\text{g}/\text{cm}^2$ with a gold flash) target. Triton momentum spectra corresponding to ground state of ^{26}Si measured at 25° spectrograph angle. Focal-plane detection system comprised position-sensitive gas ionization drift chamber followed by a scintillator. Deduced mass excess of ^{26}Si ΔM =-7139.5 keV 10.

$^{28}\text{Si}(\text{p},\text{t})$ 2010Ma43,2011Ma46,2002Ba25 (continued) ^{26}Si Levels

E(level) [†]	J π ^b	L ^d	S	Comments
0.0	0+			
1796.7 6	2+			
2785.2 12	2+			
3334.2 17	0+			
3756.8 6	3+			
4138.7 ^{&} 10	2+			
4186.9 ^{&} 12	3+			
4446.2 5	4+	(2+)		
4798.5 16	4+	(0+2+4) ^e		
4808.6 17	(2+)	(0+2+4) ^e		
4830.3 16	(0+)	(0+2+4) ^e		
5145.7 13	2+	2		
5229? [‡] 12				E(level): The authors of 2010Ma43 raise doubts over the existence of this level. They claim its observation in 1972Pa02 is likely from an overlap of the 5145.7(13) and 5289.0(13)-keV levels obscured by the tail of the $^{10}\text{C}_{\text{gs}}$ impurity peak at the same position.
5289.0 13	4+			
5515 5	4+	(4)		E(level): From 2002Ba25. Other values: 5562 keV 28 (1972Pa02); 5517.2 keV 6 (2010Ma43 – used as calibration energy).
5674.9 22	1+		0.0048 ^h	S: other value: 0.004 (1996I101). E _p (c.m.)=155 keV (2006Ba65). $\Gamma_p=1.3\times 10^{-12}$ keV; $\Gamma_\gamma=1.1\times 10^{-4}$ keV (2006Ba65).
5916 2	3+		0.141 ^h	E(level): From 2002Ba25. Other values: 5927 keV 4 (2010Ch44), 5921 keV 12 (tentative value in 2010Ma43). J π : From angular distribution measurements of tritons in smaller angles and comparison with the mirror ^{26}Mg nucleus (2006Ba65). 2006Ba65 conclude other possible 2+ assignment is less likely due to absence in mirror nucleus. L: 0 from 2002Ba25 based on $\sigma(\theta)$. But new $\sigma(\theta)$ data and re-analysis (by 2006Ba65) of angular distribution by DWBA and FRESKO codes give agreement with L=2 for direct reaction and L=3 for multi-step process. 2010Ch44 also claim experimental confirmation as the first L=0 state above the proton-emission threshold, with a proton-decay branching ratio consistent with unity. See comments for 5890 and 5945.9 keV in Adopted Levels. S: other value 0.14 1996I101. E _p (c.m.)=396 keV (2006Ba65). $\Gamma_p=2.3\times 10^{-3}$ keV; $\Gamma_\gamma=3.3\times 10^{-5}$ keV (2006Ba65).
5944 20	(0+)		0.039 ^h	E(level): Tentative value in 2010Ma43. Other value: 5960 keV 22 (1972Pa02). J π : From Adopted Levels. S: other value 0.047 1996I101. E _p (c.m.)=428 keV (2006Ba65). $\Gamma_p=1.9\times 10^{-5}$ keV; $\Gamma_\gamma=8.8\times 10^{-6}$ keV (2006Ba65). $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=0.91$ 10 (2010Ch44).
6295.7 24	2+	(2) ^f	0.0087 ^h	E(level): Other value: 6300 keV 4 (2002Ba25). S: Other value: 0.028 (1996I101). $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=0.88$ 20 (2010Ch44).
6379 3	(2+)	(2) ^f	0.015 ^h	E(level): Other values: 6380 keV 4 (2002Ba25), 6381 keV 20 (1972Pa02). J π : From Adopted Levels. S: Other value 0.0089 (1996I101). $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=0.88$ 20 (2010CH44).
6456 3	0+		0.039 ^h	J π : In Table 1 of 2002Ba25 the J π value is listed as (1-) and sourced from 1996I101. However, the evaluators could not confirm this assignment.
6785 5	3-	(3)		$\Gamma_p/(\Gamma_p+\Gamma_\gamma)=1.21$ 24 (2010Ch44). E(level): Other values: 6787 keV 4 (2002Ba25), 6786 keV 29 (1972Pa02). L: Anisotropic decay ($l>0$).
6880 30	(3-)		0.0145 ^h	E(level): From Adopted Levels. J π : From 2002Ba25. [5+] from mirror nucleus assignment (2010Ma43).
7019 10	[3+]		0.0039 ^h	E(level): From 2002Ba25. $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=1.04$ 25 (2010Ch44).
7151 5	2+		0.045 ^h	E(level): Other values: 7160 keV 10 (2002Ba25), 7150 keV 15 (1972Pa02). $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=1.04$ 25 (2010Ch44).
7197? ^a 8	[5+]		0.0102 ^h	
7415.2 23	(4+)	(2) ^g		E(level): Other value: 7425 keV 7 (2002Ba25). $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=1.31$ 27 (2010Ch44).

Continued on next page (footnotes at end of table)

$^{28}\text{Si}(\text{p,t})$ 2010Ma43,2011Ma46,2002Ba25 (continued) **^{26}Si Levels (continued)**

E(level) [†]	J π ^b	L ^d	S	Comments
7498 4	2+	(2) g		E(level): From 2002Ba25. Other values: 7479 keV 12 (2010Ma43), 7476 keV 20 (1972Pa02). $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=1.31$ 27 (2010Ch44).
7522 12	[5-]			
7661 12	[2+]			
7701 12	3-	3		E(level): Other values: 7687 keV 22 (2002Ba25), 7695 keV 30 (1972Pa02). $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=1.18$ 23 (2010Ch44).
7874 4	1-	1		E(level): Other values: 7900 keV 22 (2002Ba25), 7902 keV 21 (1972Pa02). $\Gamma_p/(\Gamma_p+\Gamma_\gamma)=1.11$ 22 (2010Ch44).
8166? § 7				
8222 5	[1-]			
8269 4	[2+]			
8557? a 4	[2+]			
8687? a 12	[4+]			
8989 7	[4+]			
9124? § 8				
9316# 5	[4+] c		0.015 i	E $_{\alpha}(\text{res})=152$ keV. Mirror state in ^{26}Mg at 9579 keV 3 (2011Ma46).
9605# 10	[2+] c		0.037 i	E $_{\alpha}(\text{res})=441$ keV. Mirror state in ^{26}Mg at 9856.52 keV 6 (2011Ma46).
9762# 4	[5-] c		0.007 i	E $_{\alpha}(\text{res})=598$ keV. Mirror state in ^{26}Mg at 10040 keV 2 (2011Ma46).
9903.4# 20	[0+] c		0.037 i	E $_{\alpha}(\text{res})=739.4$ keV. Mirror state in ^{26}Mg at 10159 keV 3 (2011Ma46).
9952? § 17				E(level): Uncertain level not adopted. Present only in this data set.
10436? @ 10				
10660? @ 2				
11010? @ 3				

[†] From 2010Ma43, except where noted.[‡] Taken from 1972Pa02.[§] From 2010Ch44, tentative level.# Resonance level above α -emission threshold taken from 2011Ma46.

@ Possible fluctuation rather than a discrete level (2011Ma46).

& Reported as an unresolved doublet in 2002Ba25 with a 4155-keV centroid.

^a Tentative observation of energy level in 2010Ma43.^b Taken from adopted values presented in 2010Ma43 except where noted: From angular distribution measurements in 2007Se02 for levels up to 5518 keV; from measured differential cross sections and Hauser-Feshbach analysis in 2004Pa42 for higher levels. Values in square brackets are from mirror assignments deduced in 2010Ma43 unless noted otherwise.^c Assignment based on correlating observed levels with known natural-parity levels in the mirror nucleus ^{26}Mg in 2011Ma46 since population of these levels is preferential in the (p,t) reaction.^d Based on distorted-wave Born approximation analysis in 2002Ba25.^e Multiplet peak centered on 4805 keV well described by a combination of L=2+4 partial waves in 2002Ba25. However, an additional L=0 component reported in 1982Bo14 could not be ruled out.^f Angular distribution for 6300+6380-keV doublet peak fit well by an L=2 transfer in 2002Ba25.^g Angular distribution for 7425+7498-keV doublet peak fit well by an L=2 transfer in 2002Ba25.^h Single-particle spectroscopic factor C²S deduced from measured $\sigma(\theta)$ in 2010MA43.ⁱ Alpha-particle spectroscopic factor S $_{\alpha}$ deduced in 2011MA46 from analysis of mirror states in ^{26}Mg .

$^{28}\text{Si}(\alpha, ^6\text{He})$ 2008Kw01,2005ShZY

2008Kw01: The reaction $^{28}\text{Si}(\alpha, ^6\text{He})^{26}\text{Si}$ was measured to confirm unnatural-parity states above proton threshold.

Measurement used high-resolution quadrupole-dipole-dipole particle analyzer for the detection of charged particles at the Center for Nuclear Study, University of Tokyo. Focal-plane detection system comprised a gas counter (position) and plastic scintillators (energy loss). ^4He beam $E(\text{lab})=120$ MeV, intensity typically 70 nA at target. Self-supporting natural silicon target (1 mg/cm²) used to populate states in ^{26}Si . Angular distribution of ^6He measured at 8°, 11°, 15°, and 20° in the lab. Measured excitation energies of ^{26}Si up to 8 MeV. Overall FWHM 90 keV.

2005ShZY: $^{28}\text{Si}(\alpha, ^6\text{He})$ measurement using 205 MeV ^4He beam (200 nA intensity) on a self-supported enriched ^{28}Si foil (0.7 mg/cm²) at the Research Center for Nuclear Physics, Osaka University. Beam taken from the K=400 ring cyclotron and reaction products transported through the 0° Grand Raiden spectrometer to the focal-plane detection system comprising two vertical drift chambers (position) and three plastic scintillators (particle identification and time of flight). Several resonances up to around 10 MeV observed above the 5.516-MeV proton threshold.

 ^{26}Si Levels

E(level) [†]	Comments
1795.9 $\frac{1}{2}^{\pm}$ § 2	
2783.5 $\frac{1}{2}^{\pm}$ § 4	
3337 3	
4138 11	
4170 $\frac{1}{2}^{\pm}$ 4	E(level): 2008Kw01 note this as a doublet of 4138- and 4183-keV.
4445 $\frac{1}{2}^{\pm}$ § 3	
4805 $\frac{1}{2}^{\pm}$ § 2	
5151 4	
5312 2	
5508 $\frac{1}{2}^{\pm}$ 3	
5892 4	
5918 $\frac{1}{2}^{\pm}$ 8	
6101 $\frac{1}{2}^{\pm}$	E(level): Possibly a new state, 2008Kw01 note.
6292 8	
6364 $\frac{1}{2}^{\pm}$ 4	E(level): Average centroid of doublet peak and not adopted by evaluators.
6787 $\frac{1}{2}^{\pm}$ 4	
6810 8	
7018 $\frac{1}{2}^{\pm}$ 6	
7161 $\frac{1}{2}^{\pm}$ 6	
7199 6	
7429 $\frac{1}{2}^{\pm}$ 7	
7447? 2	E(level): Uncertain level not adopted. Present only in this data set.
7480 $\frac{1}{2}^{\pm}$ 20	
7676 $\frac{1}{2}^{\pm}$ 4	
7705 3	
7885 $\frac{1}{2}^{\pm}$ 4	
7921 3	
8282 6	
8431 6	
8570 4	
8806 5	
8952 7	
9067 5	
9247 8	
9374 7	
9607 9	
9802 7	
9917 2	
10070 8	
10294 7	

[†] Level energy taken from 2005ShZY, except otherwise noted.

[‡] Level energy taken from 2008Kw01.

§ Used for calibration (2008Kw01).

$^{29}\text{Si}(^3\text{He},^6\text{He})$ 2002Ca24 $J(^{26}\text{Si})=1/2+$.

Excited states observed in ^{26}Si using the reaction $^{29}\text{Si}(^3\text{He},^6\text{He})^{26}\text{Si}$ at $E(^3\text{He})=51$ MeV incident upon carbon-backed ^{29}Si (59.5% enriched, 0.161 mg/cm²) and $^{29}\text{SiO}_2$ (95% enriched, 0.17 mg/cm²) targets. Focal plane detection system (7.5°) comprising a gas-ionization drift chamber for energy loss measurements, backed by a scintillator for residual charged-particle energy measurement. See also 2001CaZY.

 ^{26}Si Levels

E(level) [†]	$J\pi$ [†]	Comments
0.0	0+	
1795.9 §	2+ [‡]	
2783.5 §	2+ [‡]	
4144 8	2+	E(level): 2002Ca24 fit a broad single peak at 4148 keV 5 for two states at 4144 and 4211.
4211 16	3+	
4446 §	2+, 4+	
4806 §	0+, 2+, 4+	
5140 10	2+	
5291	4+	
5526 8	4+	
5678 8	1+ [‡]	
5945 8	3+ [‡]	J π : Based on weak population, 2002Ca24 discarded 0+ and assign 3+.

[†] Values suggested by 2002Ca24 based on their charged-particle spectroscopy measurements in comparison to angular-distribution results presented in 2002Ba25 (p,t) and 1982Bo14 (^3He ,n), and the compilation in 1996I101.

[‡] Assignment based on comparison of observed excitation energy with calculated Coulomb-shifted level from 1996I101.

§ Used for calibration.

Adopted Levels, Gammas

Q(β⁻)=-16110 SY; S(n)=16840 SY; S(p)=140 SY; Q(α)=-9650 SY 2012Wa38.
 Estimated uncertainties (2012Wa38): 630 for Q(β⁻), 450 for S(n) and Q(α), 200 for S(p).
 S(2n)=38490 540, S(2p)=3560 200, Q(εp)=12600 200 (syst, 2012Wa38).
 2004Th09: ²⁶P isotope produced in fragmentation of ³⁶Ar¹⁸⁺ ions at E=95 MeV/nucleon on a 357.1-mg/cm² ¹²C production target at the GANIL facility. Fragment separation with LISE3 spectrometer; ions implanted in a stacked silicon detector and identified through their TOF. Measured E_γ, E(p), J^π, I(p), I_γ, γγ, γβ coin, pβ coin, pγβ coin, half-life using one segmented Ge clover detector and five stacked Si detectors.
 1983Ca06 (also 1984Ca29, 1984CaZV thesis): ²⁶P produced and identified in ²⁸Si(³He,p4n) reaction at E=110-130 MeV with intensities 3-7 μA from the 88-Inch Cyclotron of the Lawrence Berkeley National Laboratory. Beta-delayed protons measured using a 3-element ΔE-ΔE-E silicon telescope. Measured beta-delayed two-proton pp-coin, E(p), half-life, %εp, %ε2p.
 1983Ho23: ²⁶P produced in ²⁸Si(³He,p4n) using E(³He)=110 MeV with intensity of 3-7 μA from the 88-Inch Cyclotron at the Lawrence Berkeley National Laboratory. Measured β delayed protons using three-element ΔE-ΔE-E silicon telescope. A two-proton group at 4.914 MeV assigned to decay of ²⁴Mg ground state following superallowed beta decay of ²⁶P to analogue T=2 state in ²⁶Si. Deduced 2p/1p ratio.
 1998Na34: ⁹Be(²⁶P,²⁵Si),E=65 MeV/nucleon and projectile momentum spread of 0.5%. ²⁶P produced via fragmentation of a 100 MeV/nucleon primary ³⁶Ar beam on a 470-mg/cm² Be production target and selected using the A1200 fragment separator at the National Superconducting Cyclotron Laboratory (NSCL). Two x/y position-sensitive cathode-readout drift chambers recorded momentum and angle information of projectile-residue fragments produced in one-proton removal on a 14-mg/cm² Be breakup target at focal plane of S800 superconducting spectrograph. Coincident γ rays with breakup events measured using a 38-detector NaI(Tl) array surrounding the target chamber. Measured E_γ, (residue)γ-coin; reconstructed momentum distributions using ion-optics code COSY, deduced proton-halo structure in ²⁶P.

²⁶P Levels

Cross Reference (XREF) Flags

A C(²⁸Si,X)

E(level)	J _π	XREF	T _{1/2}	Comments
0.0	(3)+	A	43.7 ms 6	%ε+β ⁺ =100; %εp=36.8 20; %ε2p=2.16 24 (2004Th09); %εα=0 (2004Th09). T=2. J _π : log ft=4.9 to 2+; ε to (3+) and (4+) levels in ²⁶ Si; isobaric analogue of T=2, 13015, (3+) state in ²⁶ Si. T _{1/2} : from 2004Th09, time correlations of ²⁶ P ions and β or β-2p decay events). Other: 20 ms +35-15 (1984Ca29, 1983Ca06, 1983Ho23, 1984CaZV thesis). Total branch for the proton-unbound levels is measured as 39% 2; and %ε2p is measured as 2.16 24 (2004Th09); from which %εp=36.8 20. Other measurement: %εp branch to T=2 analogue state =1.9% (1984Ca29, 1983Ca06, 1984CaZV thesis); who also estimated 2p/1p ratio for the decay of IAS as =1 to within 50% (2p/1p=1.5 within a factor of two in 1983Ho23). Corresponding εp branch in 2004Th09 is 5.3% 4, and 2p/1p=0.69 9. Delayed εα decay branch is energetically possible and was searched in experiments by 1984Ca29 and 2004Th09, but no evidence was found. Theoretical calculation of εp and ε2p probabilities: 1991De26.
164.4 1		A	120 ns 9	T _{1/2} : Deduced by fitting 164γ(t) decay curve using maximum likelihood method.

γ(²⁶P)

E(level)	E _γ	I _γ
164.4	164.4 1	100

C(²⁸Si,X) 2014NiZZ

Secondary beam of ²⁶P obtained bombarding ²⁸Si beam, E=300 MeV/nucleon, on polyethylene target (thickness 1.9 g/cm²); ²⁸Si beam was delivered for a duration of 1 s with 3.3 s repetition time; neutron-deficient nuclei separated by passing through secondary beam line and identified by time-of-flight and energy loss ΔE in 0.5 mm thick Si detector; Yield of ²⁶P was 30 and purity 4% with main impurity ²⁵Si; Finally, ²⁶P beam, 100 MeV/nucleon, implanted in an acrylic stopper (thickness 0.6 g/cm²) after passing through a plastic scintillator, a parallel-plate avalanche counter (PPAC), and a carbon energy degrader; γ rays were measured using two high-purity germanium detectors with 0.5 mm-thick Be windows; identified excited state in ²⁶P, deduced half-life.

²⁶P Levels

E(level)	Jπ	T _{1/2}	Comments
0.0	(3)+		
164.4 I		120 ns 9	T _{1/2} : Deduced by fitting 164γ(t) decay curve using maximum likelihood method.

γ(²⁶P)

Eγ	E(level)
164.4 I	164.4

Adopted Levels

S(p)=-50 SY; Q(α)=-8690 SY 2012Wa38.

S(p)=50 (syst) 720 (syst), Q(α)=-8690 (syst) 780 (syst) (2012Wa38).

2011Fo08: $^9\text{Be}(^{32}\text{S},\text{X}\gamma) - ^{32}\text{S}$ beam, E=50.3 MeV/nucleon, from bombarded a ^9Be target (thickness 92.4 mg/cm²). Fragments were separated by ACCULINNA separator at JINR, Dubna facility. Time-of-flight- ΔE and $\Delta E-E$ techniques using plastic scintillators and Si strip detectors were used to identify fragments. The separator was tuned to optimum transmission of ^{26}S , ^{27}S , ^{28}S and ^{29}S . Total time of flight through the separator was 314-322 ns.

From systematics of fragmentation cross sections, 16 +6-4 events expected for ^{26}S , but no events could be ascribed to this nuclide.

 ^{26}S Levels

E(level)	J π	T _{1/2}	Comments
0.0?	0+	<79 ns	%p=? T _{1/2} : Estimated from flight time of 314-322 ns, Poisson statistics of the observed distribution (2011Fo08) of one to four events. At 98% confidence level, T _{1/2} <157 ns. Based on experimental half-life limit, 2011Fo08 deduce Q(2p)>640 keV in absence of one-proton decay branch, and >230 keV if one-proton decay branch is allowed (2011Fo08).

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