

²⁶Mg(¹⁸O,p2nγ),²⁷Al(¹⁶O,2pγ) 1978Eg01,1975OI01,1974Li07

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja, E. A. Mccutchan		NDS 133, 1 (2016)	30-Sep-2015

Includes ²⁷Al(¹⁹F,αpγ) and ²⁸Si(¹⁹F,α2pγ) from 1975OI01 and ²⁴Mg(²⁴Mg,α3p) from 2008Sa04.

1978Eg01: ²⁶Mg(¹⁸O,p2nγ) with E(¹⁸O)=34 MeV. Measured Eγ, Iγ, γγ using a Compton-suppression spectrometer in conjunction with two Ge(Li) detector, γ(θ) using a Ge(Li) detector and γ(lin pol) with a three crystal Ge(Li) Compton-polarimeter.

1975OI01: ²⁶Mg(¹⁸O,p2nγ) with E(¹⁸O)=40 MeV. Measured Eγ, Iγ, γ(θ), γ(lin pol) using a Compton polarimeter consisting of two coaxial Ge(Li) detectors. Includes ²⁷Al(¹⁹F,αpγ) at E=40 MeV and ²⁸Si(¹⁹F,α2pγ) at E=45 MeV.

1974Li07: ²⁷Al(¹⁶O,2pγ) with E(¹⁶O)=32.5-44 MeV. Measured Eγ, Iγ, γγ using two Ge(Li) detectors; deduced lifetimes by Recoil-distance method (RDM).

1981Le19: ²⁶Mg(¹⁸O,p2nγ) with E(¹⁸O)=36 MeV. Measured g factors by time dependent recoil into gas method and lifetimes using RDM for 2528-, 2774-, and 4983-keV levels.

1978CI09: ²⁷Al(¹⁶O,2pγ) with E(¹⁶O)=34 MeV. Measured Eγ, Iγ using two Ge(Li) detectors; deduced lifetimes using RDM and plunger method.

1976Me09: ²⁷Al(¹⁶O,2pγ) with E(¹⁶O)=34 MeV. Measured Eγ using two Ge(Li) detectors; deduced lifetimes using RDM and plunger method.

1976Ra05: ²⁷Al(¹⁶O,2pγ) with E(¹⁶O)=32.5 MeV. Measured Eγ, Iγ, γ(θ,t) deduced lifetimes of 2774- and 4983-keV levels by RDM.

1973Go31: ²⁷Al(¹⁶O,2pγ) with E(¹⁶O)=20-60 MeV. Measured Eγ, Iγ, excitation function, γγ using two Ge(Li) detectors; deduced lifetimes by RDM.

Others: 1975Bo44: ²⁷Al(¹⁶O,2pγ), with E(¹⁶O)=30-35 MeV. Measured γ(θ,H), deduced hyperfine field parameters; 2011Ch54:

²⁷Al(¹⁶O,2pγ), with E(¹⁶O)=34 MeV. Measured Eγ, Iγ, integrated polarizational-directional correlation from oriented nuclei.

Results of 2011Ch54 consistent with prior measurements. 2008Sa04: ²⁴Mg(²⁴Mg,α3pγ) with E(²⁴Mg)=45.7 MeV. Measured Eγ, reported observation of 247γ, 708γ, 850γ, 1123γ, 1500γ, 1677γ.

Additional information 1.

⁴¹K Levels

E(level) [†]	J ^π [‡]	T _{1/2} [#]	Comments
0.0	3/2 ⁺		
1293.66 4	7/2 ⁻	8.1 ns 11	g=+1.29 3 (1975Bo44)
1677.27 17	7/2 ⁺	5.4 ps 22	T _{1/2} : from RDM (1974Li07). Other: >3.5 ps (1976Me09).
2527.71 18	11/2 ⁺	151 ps 4	T _{1/2} : weighted average of 9.5 ps 40 (1973Go31) and 4.2 ps 21 (1976Me09). Other: <35 ps (1974Li07). g=0.82 19 (1981Le19)
2761.78 14	11/2 ⁻	0.48 ps 6	T _{1/2} : from 1978CI09. Others: 0.76 ps 55 (1976Me09), 0.90 ps +76-42 (1974Li07).
2774.23 18	13/2 ⁺	51.3 ps 16	g=0.46 7 (1981Le19) T _{1/2} : weighted average of 55.5 ps 14 (1981Le19), 53.0 ps 15 (1978CI09), 47 ps 3 (1976Me09), 50.3 ps 24 (1976Ra05), 51 ps 6 (1974Li07), 47.0 ps 14 (1973Go31).
3897.4 3	(11/2,15/2)	>0.14 ps	J ^π : ΔJ=1 γ to 13/2 ⁺ . T _{1/2} : from 1973Go31.
4274.53 18	15/2 ⁻	<0.14 ps	T _{1/2} : from 1978CI09. Others: <1.4 ps (1974Li07), 0.62 ps 55 (1976Me09).
4982.85 20	19/2 ⁻	70.7 ps 21	g=0.74 30 (1981Le19) g: other: ≈0.33 (1976Ra05). T _{1/2} : weighted average of 73.5 ps 21 (1981Le19), 67.2 ps 21 (1978CI09), 66 ps 10 (1976Me09), 74 ps 6 (1976Ra05), 70 ps 5 (1974Li07), 97 ps 14 (1973Go31).

[†] From a least-squares fit to Eγ, by evaluators.

[‡] From the Adopted Levels.

²⁶Mg(¹⁸O,p2nγ),²⁷Al(¹⁶O,2pγ) 1978Eg01,1975OI01,1974Li07 (continued)

⁴¹K Levels (continued)

From RDDS measurements, 1976Ra05 deduce that correction due to hyperfine deorientation during recoil in vacuum is at most 5%.

<u>γ(⁴¹K)</u>									
<u>E_γ[†]</u>	<u>I_γ[‡]</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.[@]</u>	<u>δ[@]</u>	<u>I_γ[#]</u>	<u>Comments</u>
246.51 7	60.3 18	2774.23	13/2 ⁺	2527.71	11/2 ⁺	M1(+E2)	+0.013 14	115 6	δ: other: -0.01 4 (1975OI01). Mult.: A ₂ =-0.210 6, A ₄ =0, POL=-0.32 3 (1978Eg01). Mult.: other: D from A ₂ =-0.267 6 (1973Go31), M1 from A ₂ =-0.28 1, POL=-0.34 7 (1975OI01).
708.31 10	26.3 8	4982.85	19/2 ⁻	4274.53	15/2 ⁻	E2		21 3	Mult.: A ₂ =+0.364 9, A ₄ =-0.091 11, POL=+0.60 6 (1978Eg01). Mult.: other: Q from A ₂ =0.290 10, A ₄ =-0.123 11 (1973Go31), E2 from A ₂ =0.29 1, A ₄ =-0.12 1, POL=0.41 7 (1975OI01), Δ _{IPDCO} =+0.12 3 (2011Ch54).
850.40 10	81 3	2527.71	11/2 ⁺	1677.27	7/2 ⁺	E2		118 6	Mult.: A ₂ =+0.354 10, A ₄ =-0.080 10, POL=+0.51 5 (1978Eg01). Mult.: other: Q from A ₂ =0.279 8, A ₄ =-0.088 8 (1973Go31), E2 from A ₂ =0.28 1, A ₄ =-0.09 1, POL=0.50 8 (1975OI01), Δ _{IPDCO} =+0.094 12 (2011Ch54).
1123.17 20		3897.4	(11/2,15/2)	2774.23	13/2 ⁺	D(+Q)	<+0.02		I _γ : mixed with a line from background (1978Eg01). Mult.: A ₂ =-0.17 4, A ₄ =0, POL=-0.19 25 (1975OI01). Mult.: other: D from A ₂ =-0.20 4 (1973Go31).
1293.64 4	100 3	1293.66	7/2 ⁻	0.0	3/2 ⁺	M2+E3	+0.118 12	100 6	δ: other: -0.08 10 (1975OI01). Mult.: A ₂ =+0.387 12, A ₄ =-0.080 14, POL=-0.46 4 (1978Eg01). Mult.: other: Q from A ₂ =0.265 10, A ₄ =-0.088 10 (1973Go31), M2(+E3) from A ₂ =0.25 2, A ₄ =-0.09 2, POL=-0.44 8 (1975OI01), Δ _{IPDCO} =-0.06 3 (2011Ch54).
1468.17 15	46.6 14	2761.78	11/2 ⁻	1293.66	7/2 ⁻	E2		36 3	Mult.: A ₂ =+0.248 11, A ₄ =-0.067 12, POL=+0.46

Continued on next page (footnotes at end of table)

$^{26}\text{Mg}(^{18}\text{O,p2n}\gamma), ^{27}\text{Al}(^{16}\text{O,2p}\gamma)$ **1978Eg01,1975OI01,1974Li07** (continued)

$\gamma(^{41}\text{K})$ (continued)

E_γ †	I_γ ‡	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. @	δ @	I_γ #	Comments
1500.14 20	6.7 4	4274.53	15/2 ⁻	2774.23	13/2 ⁺	E1(+M2)	-0.06 12	8 1	7 (1978Eg01). Mult.: other: Q from $A_2=0.195$ 12, $A_4=-0.089$ 12 (1973Go31), E2 from $A_2=0.20$ 2, $A_4=-0.10$ 2, POL=0.51 9 (1975OI01), $\Delta\text{IPDCO}=+0.079$ 24 (2011Ch54). Mult.: $A_2=-0.35$ 8, $A_4=0$, POL=+0.7 3 (1978Eg01). Mult.: other: D from $A_2=-0.37$ 3 (1973Go31), E1 from $A_2=-0.37$ 3, POL=0.47 32 (1975OI01), $\Delta\text{IPDCO}=+0.05$ 3 (2011Ch54). Mult.: $A_2=+0.330$ 20, $A_4=-0.15$ 3, POL=+0.59 12 (1978Eg01). Mult.: other: Q from $A_2=0.227$ 20, $A_4=-0.056$ 23 (1973Go31), E2 from $A_2=0.23$ 2, $A_4=-0.08$ 2, POL=0.46 16 (1975OI01), $\Delta\text{IPDCO}=+0.04$ 3 (2011Ch54). I_γ : $I_\gamma(1513\gamma):I_\gamma(1500\gamma)=80$ 3:20 3 (1973Go31), 80.5 11:19.5 11 (1978Eg01).
1512.79 15	27.4 9	4274.53	15/2 ⁻	2761.78	11/2 ⁻	E2		22 3	
1677.1 2		1677.27	7/2 ⁺	0.0	3/2 ⁺	E2		112	I_γ : mixed with a line from ^{32}P (1978Eg01). $\delta(\text{M3/E2})\approx 0$ from $A_2=+0.20$ 2, $A_4=-0.07$ 2, POL=+0.17 6 (1975OI01). Mult.: other: Q from $A_2=0.215$ 10, $A_4=-0.063$ 11 (1973Go31), E2 from $A_2=0.20$ 2, $A_4=-0.07$ 2, POL=0.17 6 (1975OI01), $\Delta\text{IPDCO}=+0.052$ 13 (2011Ch54).

† From ($^{18}\text{O,p2n}\gamma$). Weighted averages of 1978Eg01 and 1973Go31. $E_\gamma=1293.64$ 4 was used for calibration.

‡ From 1978Eg01 at $E(^{18}\text{O})=34$ MeV.

From ($^{16}\text{O,2p}\gamma$) (1974Li07). Values given by authors were given relative to $I_\gamma(1677\gamma)=100$ have been renormalized by evaluators to $I_\gamma(1294\gamma)=100$.

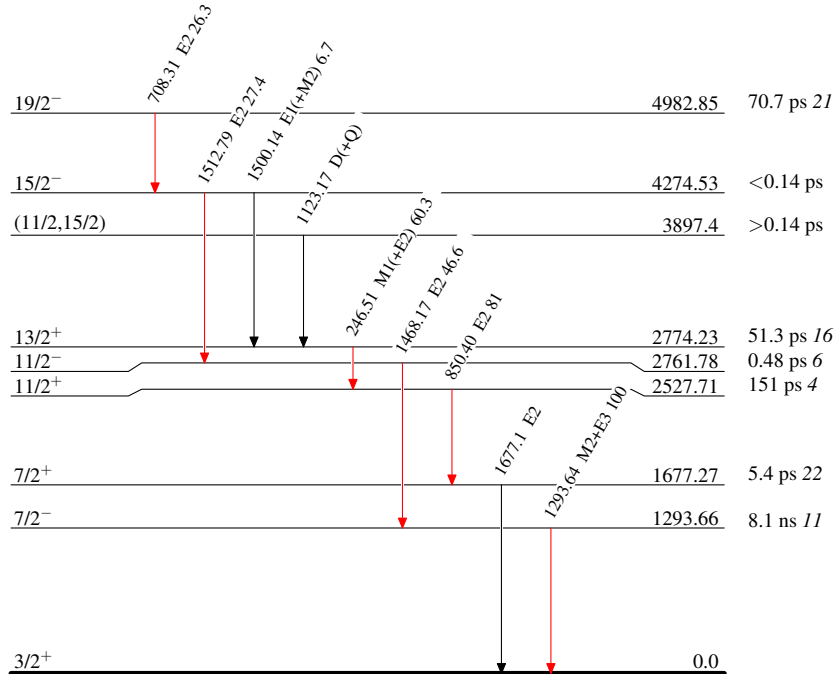
@ From $\gamma(\theta)$ and $\gamma(\text{lin pol})$ in 1978Eg01, except where noted.

${}^{26}\text{Mg}({}^{18}\text{O},\text{p}2\text{n}\gamma), {}^{27}\text{Al}({}^{16}\text{O},2\text{p}\gamma)$ 1978Eg01,1975Ol01,1974Li07

Legend

Level Scheme
 Intensities: Relative I_γ

\longrightarrow $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
 \longrightarrow $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
 \longrightarrow $I_\gamma > 10\% \times I_\gamma^{\text{max}}$

 ${}^{41}_{19}\text{K}_{22}$