

$^{26}\text{Mg}(\alpha, n\gamma)$  1971Ba73, 1982Be52, 1974Vi01

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia		NDS 113, 909 (2012)	1-Jan-2012

Others: 1978Gr15, 1973Vi05, 1972Ba44.

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

**1971Ba73:** Target: 99.7% enriched  $^{26}\text{Mg}$ ; Projectile:  $\alpha$ , E=5 to 8 MeV; Ge(Li) detector; measured  $E\gamma$ ,  $\gamma(\theta)$ ,  $\gamma$ -ray branching; deduced  $\gamma$ -ray angular correlation coefficients A2 and A4,  $\gamma$ -ray branching ratio, level scheme, mean lifetime by the Doppler shift attenuation method.

**1982Be52:** Target: 99% enriched  $^{26}\text{Mg}$ ; Projectile:  $\alpha$ , E=12,14,15 MeV; Ge(Li) detector placed at  $125^\circ$  with respect to the beam direction for beam energies 14 and 15 MeV, two Ge(Li) detectors were used for beam energy 12 MeV and placed at  $20^\circ$ ,  $90^\circ$ ,  $120^\circ$ ,  $135^\circ$ ,  $145^\circ$ ; measured neutron Time-of-Flight (TOF), n- $\gamma$  coincidence, n- $\gamma$  angular correlation; deduced level scheme,  $J^\pi$ , mean lifetime by the Doppler shift attenuation method. The  $^{28}\text{Si}(d, p\gamma)$  study has also been reported.

**1974Vi01, 1973Vi05:** Target: 99.5% enriched  $^{26}\text{Mg}$ ; Projectile:  $\alpha$ , Energies between 6.7 and 11 MeV; Compton suppressed Ge(Li) detector; Measured  $\gamma$ -rays at  $0^\circ$ ,  $30^\circ$ ,  $45^\circ$ ,  $60^\circ$  and  $90^\circ$  with respect to the beam direction; deduced level scheme, mixing ratio,  $J^\pi$ .

**1972Ba44:** Target: 99.5% enriched  $^{26}\text{Mg}$ ; Projectile:  $\alpha$ , energies between 4.5 and 9.5 MeV; Compton suppressed  $\gamma$ -ray detector (Presumably a Ge(Li) detector – has not been mentioned); Measured  $\gamma$ -rays at  $0^\circ$ ,  $55^\circ$ ,  $70^\circ$ ,  $90^\circ$ ,  $110^\circ$  and  $125^\circ$ ,  $\gamma$ -ray branching; deduced mean lifetime by the Doppler shift attenuation method.

 $^{29}\text{Si}$  Levels

E(level) <sup>†</sup>	$T_{1/2}$ <sup>&amp;</sup>	Comments
0		
1272.95 15	250 fs 49	
2027.63 18	250 fs 49	
2425.02 16	9 fs 2	
3066.8 4	14 fs 5	
3623.1 3	2.8 ps 6	
4079.5 3	33 fs 6	
4740.5 4	31 fs 7	
4838.1 8	<3.5 fs	
4894.8 4	7 fs 2	
4932.4 6	<7 fs	
5254.1 4	69 fs 14	
5284.1 6	<7 fs	
5651.8 7	28 fs 10	
5811.2 7	<14 fs	
5947 3	<21 fs	
6106.4 5	<6 fs	
6189.8 13	<10 fs	
6377 3		
6424.0 <sup>#</sup> 5	<14 <sup>#</sup> fs	
6496.7 <sup>#</sup> 6	<24 <sup>#</sup> fs	
6522 1	<10 fs	E(level), $T_{1/2}$ : Other: 6517 keV 4 (1972Ba44), $T_{1/2}$ from 1972Ba44; Other: <14 fs (1982Be52).
6615 1	<14 fs	
6782 1	21 fs 10	
6921 1	<14 fs	
7016 <sup>#</sup> 3	32 <sup>#</sup> fs 10	
7057 1	<14 fs	
7072 1	<10.4 <sup>a</sup> fs	$T_{1/2}$ : Other: <14 fs (1982Be52).
7139 1	29 fs 10	
7521 1	<14 fs	
7621 1	<10.4 <sup>a</sup> fs	$T_{1/2}$ : Other: <14 fs (1982Be52).
7767 1	<14 fs	
7787 1	15 fs 8	

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$^{26}\text{Mg}(\alpha, n\gamma)$  1971Ba73, 1982Be52, 1974Vi01 (continued) $^{29}\text{Si}$  Levels (continued)

E(level) <sup>†</sup>	$T_{1/2}$ <sup>&amp;</sup>	Comments
7987 1	<14 fs	
8161 1	<14 fs	
8173 1	<14 fs	
8209 1	<14 fs	
8331.0 <sup>@</sup> 6	<10.4 <sup>@a</sup> fs	
8475.7 <sup>@</sup> 9	<10.4 <sup>@a</sup> fs	
8609 <sup>‡</sup> 2	<14 fs	
8610 <sup>‡</sup> 2	<14 fs	
8622 2	<14 fs	
8641 2	<14 fs	$T_{1/2}$ : Other: <28 fs (1974Vi01).
8670 2	<14 fs	
8760.6 <sup>@</sup> 7	<10.4 <sup>@a</sup> fs	
8865 2	29 fs 10	$T_{1/2}$ : Other: <28 fs (1974Vi01). Some earlier studies (1973Be28, 1972El18, 1974Me14, 1974Vi01) reported a level with excitation energy about 8861 keV 1. In 1982Be52, same experimental group of 1973Be28, a comparable level excitation energy of 8865 keV 2 is reported.
9326 2	<14 fs	

<sup>†</sup> Up to 6377 keV from a least-squares fit to  $\gamma$ -ray energies (some level energies are lower by 2 to 3 keV compared to the Adopted Level energies, please see  $\gamma$ -ray comment in  $\gamma$ -ray Table). Above 6377 keV, level energies are from 1982Be52, except otherwise noted.

<sup>‡</sup> 8609 and 8610 keV levels were indistinguishable experimentally, the level energy has been presented in 1982Be52, based on conflicting  $\gamma$ -decay mode from the  $^{26}\text{Mg}(\alpha, n\gamma)$  reactions with 12 and 14 MeV beam energies.

# From 1972Ba44.

@ From 1974Vi01.

& From 1971Ba73 (for levels < 6193-keV) and from 1982Be52 (for levels > 6193-keV), except otherwise noted. Measured using Doppler Shift Attenuation method.

<sup>a</sup> From 1974Vi01.

 $\gamma(^{29}\text{Si})$ 

$E_\gamma$ <sup>†</sup>	$E_i$ (level)	$E_f$	Mult. #	$\delta$ <sup>@</sup>	Comments
556.2 2	3623.1	3066.8			
660.2 22	4740.5	4079.5			
755.5 5	2027.63	1272.95			
1035.3 15	3066.8	2027.63			
1152.1 2	2425.02	1272.95			
1273.1 2	1272.95	0			
1572.2 6	5651.8	4079.5	D+Q	+0.31 4	$A_2=0.33$ 4, $A_4=-0.13$ 4.
1595.5 2	3623.1	2027.63			
1631.0 3	5254.1	3623.1	D+Q	+0.49 7	$A_2=0.39$ 9, $A_4=0.03$ 10.
1979.2 <sup>‡</sup> 5	8760.6	6782			
2027.5 2	2027.63	0			
2051.9 5	4079.5	2027.63	D		$A_2=-0.04$ 5, $A_4=-0.03$ 5.
2424.8 2	2425.02	0			
2585.3 20	5651.8	3066.8	Q		$A_2=0.33$ 4, $A_4=-0.14$ 3.
2712.8 3	4740.5	2027.63	Q		$A_2=0.33$ 3, $A_4=-0.22$ 3.
2745.3 11	5811.2	3066.8			
2806.3 3	4079.5	1272.95	Q		$A_2=0.47$ 2, $A_4=-0.36$ 3.

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$^{26}\text{Mg}(\alpha, n\gamma)$  **1971Ba73, 1982Be52, 1974Vi01** (continued) $\gamma(^{29}\text{Si})$  (continued)

$E_\gamma$ †	$E_i(\text{level})$	$E_f$	Mult. #	$\delta$ @	Comments
2823.9 ‡ 5	8475.7	5651.8			
2867.0 7	4894.8	2027.63	D+Q	-0.04 7	$A_2=0.33$ 11, $A_4=0.14$ 12.
3256.3 5	5284.1	2027.63	D+Q		$A_2=-0.66$ 2, $A_4=-0.01$ 2.
3505.6 ‡ 8	8760.6	5254.1			
3621.6 4	4894.8	1272.95	D		$A_2=-0.25$ 3, $A_4=-0.07$ 3.
3680.0 10	6106.4	2425.02			
3782.8 8	5811.2	2027.63	D+Q	-2.19 23	$A_2=-0.72$ 6, $A_4=0.30$ 6.
3899.0 ‡ 9	8641	4740.5			
3998 ‡ 1	7621	3623.1			
4078.8 5	6106.4	2027.63	D+Q		$A_2=0.39$ 3, $A_4=0.01$ 3.
4161.9 12	6189.8	2027.63	D+Q		$A_2=-0.22$ 5, $A_4=-0.05$ 5.
4706.8 ‡ 5	8331.0	3623.1			
4837.7 8	4838.1	0	D		$A_2=-0.01$ 4, $A_4=0.04$ 4.
4893.8 12	4894.8	0	Q		$A_2=0.42$ 6, $A_4=-0.33$ 7.
4931.9 6	4932.4	0	D		$A_2=-0.37$ 3, $A_4=0.02$ 3.
5041 ‡ 2	7072	2027.63			
5946 3	5947	0	D+Q		$A_2=-0.47$ 8, $A_4=0.12$ 8.
6376 3	6377	0	D		$A_2=-0.15$ 7, $A_4=-0.07$ 8.

† From 1971Ba73, except otherwise noted. Some  $\gamma$ -rays are lower by 0.5 to 1.0 keV compared to Adopted  $\gamma$ -rays.

‡ From 1974Vi01.

# Assigned by the evaluator from angular correlation co-efficients  $A_2$  and  $A_4$  values. All  $A_2$  and  $A_4$  values are from 1971Ba73.

@ From 1971Ba73.

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## Level Scheme

