

$^{24}\text{Mg}(^3\text{He},n)$  2004Pa42,1986A115,1982Bo14

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia and A. M. Hurst		NDS 134, 1 (2016)	1-Feb-2016

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%)  $^{24}\text{Mg}$  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  $0^\circ$ , 8.11 at  $60^\circ$ , and 10.0 MeV at  $0^\circ$ . Measured neutron-energy spectra using liquid scintillators in tof arrangement.  $J^\pi$  assignments established by comparison of measured differential cross sections with Hauser-Feshbach predictions. Deduced reaction rates for  $^{25}\text{Al}(p,\gamma)^{26}\text{Si}$ .

[1986A115](#): Measurement using University of Colorado neutron time-of-flight facility.  $^3\text{He}$  beam  $E(\text{lab})=25.4$  MeV,  $^{24}\text{Mg}$  rolled target (99% enriched) thickness= $1.3 \text{ mg}/\text{cm}^2$ . 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,  $J^\pi$  assignments, angular momentum L-transfer values, shell-model analysis.

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

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

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

<sup>†</sup> Taken from [2004Pa42](#) except where noted.

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$^{24}\text{Mg}(^3\text{He},n)$  [2004Pa42](#),[1986A115](#),[1982Bo14](#) (continued)

$^{26}\text{Si}$  Levels (continued)

- ‡ 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 [1986A115](#).
- <sup>a</sup> DWBA calculations in [1982Bo14](#) also support L=1.
- <sup>b</sup> Assignments from measured differential cross sections and comparison with Hauser-Feshbach calculations in [2004Pa42](#) except where noted.
- <sup>c</sup> Deduced from comparison between measured angular distributions and DWBA analysis in [1982Bo14](#).