

$^9\text{Be}(^{38}\text{Si},^{37}\text{Si}\gamma)$  **2014St18**

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	ENSDF	31-May-2015

One-neutron knockout reaction.

**2014St18:**  $E=86$  / MeV/nucleon  $^{38}\text{Si}$  secondary beam was produced in fragmentation of 140 MeV/nucleon  $^{48}\text{Ca}$  primary beam with a  $^9\text{Be}$  production target, followed by purification in A1900 fragment separator at NSCL-MSU facility. Secondary  $^9\text{Be}$  target was 287 mg/cm<sup>2</sup> thick. Reaction residues were identified by an ionization chamber in the focal plane of S800 spectrograph; time-of-flight was measured by a plastic scintillator. Measured  $E\gamma$ ,  $I\gamma$ ,  $\gamma\gamma$ -coin, ( $^{35}\text{Si}$ ) $\gamma$ -coin using GRETTINA array of Ge detectors. Deduced levels, J,  $\pi$ , l-transfer from parallel momentum distributions. Comparison with large-scale shell calculations. See also **2015St06**.

**2015St06:** from the same group as **2014St18**; neutron knockout cross sections analyzed for excited states. For experimental details, see **2014St18**.

All data are from **2014St18**, unless otherwise noted.

 $^{37}\text{Si}$  Levels

E(level) <sup>†</sup>	J $\pi$ <sup>‡</sup>	T <sub>1/2</sub>	L <sup>#</sup>	Comments
0	(5/2 <sup>-</sup> )			Total knockout $\sigma=104$ mb 3.
0+x	(7/2 <sup>-</sup> )			Partial knockout $\sigma=47$ mb 9 ( <b>2014St18,2015St06</b> , includes contribution from 5/2 <sup>-</sup> ).
156 3	(3/2 <sup>-</sup> )	3.0 ns 7		T <sub>1/2</sub> : from analysis of broadened lineshape ( <b>2014St18</b> ). Partial knockout $\sigma=9$ mb 7 ( <b>2014St18,2015St06</b> ).
693 4	(3/2 <sup>-</sup> )		0,1	Partial knockout $\sigma=7$ mb 3 ( <b>2014St18,2015St06</b> ).
717 4	(3/2 <sup>+</sup> )		2	Partial knockout $\sigma=19$ mb 2 ( <b>2014St18,2015St06</b> ).
1438? 6	(1/2 <sup>-</sup> )			Partial knockout $\sigma=3$ mb 1.
1596 5	(1/2 <sup>+</sup> )			Partial knockout $\sigma=10$ mb 1 ( <b>2014St18,2015St06</b> ).

<sup>†</sup> From a least-squares fit to  $\gamma$ -ray energies.

<sup>‡</sup> From shell-model predictions, and from L-transfers in a few cases (**2014St18**).

<sup>#</sup> From parallel momentum distribution and Eikonal model analysis (**2014St18**).

 $\gamma(^{37}\text{Si})$ 

E <sub><math>\gamma</math></sub>	I <sub><math>\gamma</math></sub>	E <sub>i</sub> (level)	J <sub>i</sub> <sup><math>\pi</math></sup>	E <sub>f</sub>	J <sub>f</sub> <sup><math>\pi</math></sup>	Mult.	Comments
156 3	36 5	156	(3/2 <sup>-</sup> )	0	(5/2 <sup>-</sup> )	[M1]	B(M1) <sub>↓</sub> =0.0034 +10 <sup>-7</sup> ( <b>2014St18</b> )
538 4	11 1	693	(3/2 <sup>-</sup> )	156	(3/2 <sup>-</sup> )		
562 4	13 1	717	(3/2 <sup>+</sup> )	156	(3/2 <sup>-</sup> )		
692 4	6.6 9	693	(3/2 <sup>-</sup> )	0	(5/2 <sup>-</sup> )		
716 4	5.3 8	717	(3/2 <sup>+</sup> )	0	(5/2 <sup>-</sup> )		
746 4	0.8 6	1438?	(1/2 <sup>-</sup> )	693	(3/2 <sup>-</sup> )		
903 4	10 1	1596	(1/2 <sup>+</sup> )	693	(3/2 <sup>-</sup> )		
1279 <sup>†</sup> 5	1.4 5	1438?	(1/2 <sup>-</sup> )	156	(3/2 <sup>-</sup> )		
1442 <sup>†</sup> 5	0.6 5	1438?	(1/2 <sup>-</sup> )	0	(5/2 <sup>-</sup> )		
<sup>x</sup> 1750 6	2.3 7						
<sup>x</sup> 2068 6	1.9 6						
<sup>x</sup> 2115 6	1.8 6						
<sup>x</sup> 2323 6	0.8 5						

E <sub>$\gamma$</sub> : tentative  $\gamma$  ray.

<sup>†</sup> Placement of transition in the level scheme is uncertain.

<sup>x</sup>  $\gamma$  ray not placed in level scheme.

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## Level Scheme

Intensities: Yield/100 ions

## Legend

- $I_\gamma < 2\% \times I_\gamma^{\max}$
- $I_\gamma < 10\% \times I_\gamma^{\max}$
- $I_\gamma > 10\% \times I_\gamma^{\max}$
- - - - -→  $\gamma$  Decay (Uncertain)
- Coincidence

