

$^{28}\text{Si}(\alpha, ^6\text{He})$ [2008Kw01,2005ShZY](#)

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

Additional information 1.

[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 enA at target. Self-supporting natural silicon target (1 mg/cm^2) 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 enA intensity) on a self-supported enriched ^{28}Si foil (0.7 mg/cm^2) 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 ^{±#} 2	
2783.5 ^{±#} 4	
3337 3	
4138 11	
4170 [±] 4	E(level): 2008Kw01 note this as a doublet of 4138- and 4183-keV.
4445 ^{±#} 3	
4805 ^{±#} 2	
5151 4	
5312 2	
5508 [±] 3	
5892 4	
5918 [±] 8	
6101 [±]	E(level): Possibly a new state, 2008Kw01 note.
6292 8	
6364 [±] 4	E(level): Average centroid of doublet peak and not adopted by evaluators.
6787 [±] 4	
6810 8	
7018 [±] 6	
7161 [±] 6	
7199 6	
7429 [±] 7	
7447? 2	E(level): Uncertain level not adopted. Present only in this data set.
7480 [±] 20	
7676 [±] 4	
7705 3	
7885 [±] 4	
7921 3	
8282 6	
8431 6	
8570 4	
8806 5	
8952 7	

Continued on next page (footnotes at end of table)

 $^{28}\text{Si}(\alpha, ^6\text{He})$ [2008Kw01,2005ShZY](#) (continued)

 ^{26}Si Levels (continued)

<u>E(level)[†]</u>	<u>E(level)[†]</u>	<u>E(level)[†]</u>	<u>E(level)[†]</u>
9067 5	9374 7	9802 7	10070 8
9247 8	9607 9	9917 2	10294 7

[†] Level energy taken from [2005ShZY](#), except otherwise noted.

[‡] Level energy taken from [2008Kw01](#).

Used for calibration ([2008Kw01](#)).