

Adopted Levels, Gammas

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

$Q(\beta^-)=12400$ 90; $S(n)=227\times 10^1$ 11; $S(p)=1983\times 10^1$ 13; $Q(\alpha)=-13980$ 80 [2012Wa38](#)

$Q(\beta^-n)=5590$ 80, $S(2n)=8380$ 90, $S(2p)=36810$ 200 ([2012Wa38](#)).

First identification of ^{37}Si nucleus by [1979Au03](#).

Particle stability established in $^{238}\text{U}(^{40}\text{Ar},\text{X})$ ([1979Au03](#)) and beryllium+ ^{48}Ca reactions ([1979We10](#)).

[1987Gi05](#): $\text{Ta}(^{48}\text{Ar},\text{X})$ $E=60$ MeV/nucleon. Measured fragment rigidity, tof. Deduced mass excess.

[1991Zh24](#): $\text{Th}(p,\text{X})$ $E=800$ MeV. Measured fragment mass, charge state ratio, velocity histograms. Deduced mass excess.

[1991Or01](#): $\text{Ta}(^{48}\text{Ca},\text{X})$ $E=55$ MeV/nucleon. Measured projectile-like spectra at GANIL facility. Measured mass excess= -6.18 MeV 28.

[1995ReZZ](#): $\text{Th}(p,\text{X})$ $E=800$ MeV. Measured neutron emission probabilities. ToF isochronous spectrometer.

[2006Kh08](#): $\text{Si}(^{37}\text{Si},\text{X})$ $E=49.75$ and 43.40 MeV/nucleon. Measured cross sections and average radius at GANIL facility.

[2007No13](#): measured yield in $^{181}\text{Ta}(^{40}\text{Ar},\text{X})$ at 100 MeV/nucleon.

Mass measurement: [2007Ju03](#).

Structure calculations: [2004Kh16](#) (binding energies), [2008Wi11](#) (quadrupole deformation parameter, potential energy surfaces for hypernuclei).

 ^{37}Si LevelsCross Reference (XREF) Flags

- A ^{37}Al β^- decay (10.7 ms)
- B $^9\text{Be}(^{38}\text{Si},^{37}\text{Si}\gamma)$
- C Coulomb excitation

<u>E(level)[†]</u>	<u>J^π[‡]</u>	<u>$T_{1/2}$</u>	<u>XREF</u>	<u>Comments</u>
0	(5/2 ⁻)	90 ms 60	ABC	$\% \beta^- = 100$; $\% \beta^- n = 17$ 13 (1995ReZZ); $\% \beta^- 2n = ?$ Theoretical $\% \beta^- n = 18.8$, $\% \beta^- 2n = 0.24$ (1997Mo25). $T_{1/2}$: from 1995ReZZ . Other: 1999YoZW . J^π : 7/2 ⁻ proposed from syst by 2012Au07 , 3/2 ⁻ proposed in calculations of 1997Mo25 . $\sigma_R = 2.44$ b 7 at 49.75 MeV/nucleon, 2.52 b 7 at 43.40 MeV/nucleon (2006Kh08). Average $r_0^2 = 1.192$ fm ² 25 (2006Kh08).
68.2 14	(7/2 ⁻)		AB	E(level): from ^{37}Al β^- decay (2013StZY), level energy not resolved in $^9\text{Be}(^{38}\text{Si},^{37}\text{Si}\gamma)$ (2014St18).
155.4 12	(3/2 ⁻)	3.0 ns 7	AB	$T_{1/2}$: from analysis of broadened lineshape in $^9\text{Be}(^{38}\text{Si},^{37}\text{Si}\gamma)$ (2014St18).
693 3	(3/2 ⁻)		B	
717 3	(3/2 ⁺)		AB	J^π : $L(n)=2$ in $^9\text{Be}(^{38}\text{Si},^{37}\text{Si}\gamma)$, 3/2 ⁺ from shell model predictions.
1270.2 10	(5/2 ⁺)		A	
1438 3	(1/2 ⁻)	1.4 ps +30-9	BC	$B(E2)\uparrow = 0.0101$ 45 (1999Ib01) $T_{1/2}$: deduced by evaluators from measured $B(E2)$ in Coulomb excitation (1999Ib01) and γ -ray branching ratios.

[†] From a least-squares fit to γ -ray energies.

[‡] Values in square brackets are from shell model predictions ([2013StZY](#),[2014St18](#)).

Adopted Levels, Gammas (continued)

$\gamma(^{37}\text{Si})$								
$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	Mult.	$\alpha^{\text{@}}$	Comments
155.4	(3/2 ⁻)	156 3	100	0	(5/2 ⁻)	[M1]	0.00127 7	B(M1) _↓ =0.0034 +10 ⁻⁷ (2014St18) B(M1)(W.u.)=0.0019 5
693	(3/2 ⁻)	538 4 692 4	100 9 60 8	155.4 (3/2 ⁻) 0 (5/2 ⁻)				
717	(3/2 ⁺)	562 4 717 4	100 [#] 6 42 [#] 4	155.4 (3/2 ⁻) 0 (5/2 ⁻)				
1270.2	(5/2 ⁺)	1115 [‡] 1202 [‡] 1270 [‡]	88 [‡] 25 69 [‡] 25 100 [‡] 25	155.4 (3/2 ⁻) 68.2 (7/2 ⁻) 0 (5/2 ⁻)				
1438	(1/2 ⁻)	746 4 1279 5 1442 5	57 43 100 36 43 36	693 (3/2 ⁻) 155.4 (3/2 ⁻) 0 (5/2 ⁻)		[E2]		E_γ : 1437 27 from Coulomb excitation (1999Ib01).

[†] From $^9\text{Be}(^{38}\text{Si},^{37}\text{Si}\gamma)$ (2014St18), unless otherwise noted.

[‡] From $^{37}\text{Al} \beta^-$ decay (2013StZY).

[#] From from ^{37}Al decay. Corresponding values from $^9\text{Be}(^{38}\text{Si},^{37}\text{Si}\gamma)$ are nearly the same, but somewhat less precise.

[@] From BrIcc v2.3a (10-Sep-2014) 2008Ki07, "Frozen Orbitals" appr.

Adopted Levels, GammasLevel Scheme

Intensities: Relative photon branching from each level

