Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 152, 1 (2018)	30-Sep-2017

Q(β^-)=1.045×10^4 *13*; S(n)=5.67×10^3 *15*; S(p)=2.127×10^4 *21*; Q(α)=−1.492×10^4 *11* 2017Wa10
S(2n)=7880 *130*, S(2p)=39130 *700*, Q(β^-n)=6750 *110* (2017Wa10).
^{38}Si first produced and identified by 1979We10 in ^{9}Be(^{48}Ca,X) reaction at 212 MeV/nucleon.
Other measurements:
2017Tr02: ^{9}Be(^{48}Ca,X) E=140 MeV/nucleon at NSCL. Measured $T_{1/2}$, %β^-n.
1999YoZW: ^{181}Ta(^{48}Ca,X) E=70 MeV/nucleon. Measured $T_{1/2}$, %β^-n (tentative results).
1991Zh24: Th(p,X) E(p)=800 MeV followed. Measured fragment mass, charge state ratio, velocity.
2006Kh08: Si(^{38}Si,X) E=30-65 MeV/nucleon at GANIL. Measured σ. Deduced reduced strong absorption radius=1.20 fm^2 *3*.
Mass measurements: 2007Ju03, 2001Sa72 (also 2000Sa21), 1991Zh24.
Consult NSR database for about 20 theory references.

^{38}Si Levels

Cross Reference (XREF) Flags

- A ^{38}Al β^- decay
- B ^{1}H(^{38}Si,^{38}Si′γ)
- C C(^{40}S,^{38}Si2pγ)
- D Coulomb excitation

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
0	0$^+$	63 ms *8*	ABCD	%β^-=100; %β^-n=25 *10* (2017Tr02) $T_{1/2}$: from fit to measured decay curve (2017Tr02). Others: ≈100 ms (1999YoZW,tentative result). Calculated $T_{1/2}$: 90 ms (syst,2017Au03), 168 ms (2003Mo09), 49 ms (calc,2012Ch48), 266 ms (2016Ma12). %β^-n: from 100−(summed β feeding to the bound levels in ^{38}P) (2017Tr02). Other: %β^-n=38 *7* (1999YoZW, tentative result). Calculated %β^-n=36 (2003Mo09), %β^-n=9.8 (2016Ma12). Additional information 1.
1074 *2*	2$^+$	10 ps *+6−3*	ABCD	B(E2)↑=0.019 *7* (1998Ib01) β_2=0.35 *+2−3* (2007Ca35) Jπ: Coulomb excited from 0$^+$, syst of even-even nuclides. $T_{1/2}$: deduced from B(E2)↑ by the evaluator. B(E2)↑ from Coulomb excitation (1998Ib01). β_2 from ^{1}H(^{38}Si,^{38}Si′γ) (2007Ca35), deduced for vibrational model. Others: 0.34 *+2−3* (prolate rotational model), 0.38 *3* (oblate rotational model). Sign of β_2 is not given in 2007Ca35.
2233 *3*	(4$^+$)		A C	
2355? *29*	(4$^+$)		C	Jπ: from shell-model calculations in (^{40}S,^{38}Si2pγ) (2012Ta20).
3285 *3*	(3)		A	
3656?	(1$^-$)		A	E(level): possibly populated by the β-decay of ground state (2015St14).
3703 *3*	(4$^+$)		A	E(level): strongly populated by the β-decay of (5$^-$) isomer based on shell-model calculations (2015St14).

† From a least-squares fit to γ-ray energies.
‡ From shell-model predictions in ^{38}Al β^- decay (2015St14), unless otherwise noted.

Adopted Levels, Gammas (continued)

γ(^{38}Si)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Comments
1074	2^+	1074 *2*	100	0	0^+	B(E2)(W.u.)=5 *2* E_γ: others: 1084 *20* in Coulomb excitation, 1071 *12* in (^{40}S,^{38}Si2pγ).
2233	(4^+)	1159 *2*	100	1074	2^+	E_γ: other: 1168 *22* in (^{40}S,^{38}Si2pγ).
2355?	(4^+)	1284‡ *26*	100	1074	2^+	E_γ: from (^{40}S,^{38}Si2pγ) only, very weak.
3285	(3)	2211 *2*	100	1074	2^+	
3656?	(1^-)	3656‡	100	0	0^+	
3703	(4^+)	418 *2*	76 *12*	3285	(3)	
		1470 *2*	100 *12*	2233	(4^+)	

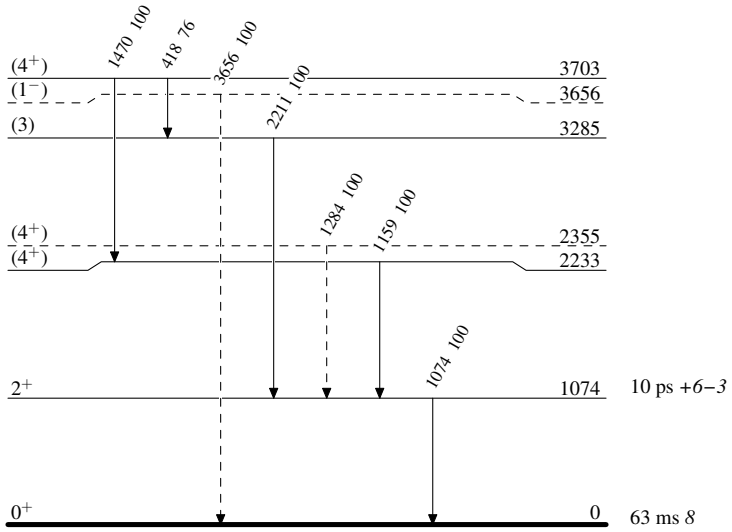
† From ^{38}Al β^- decay, unless otherwise noted.
‡ Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

Legend: - - - - - - ► γ Decay (Uncertain)



$^{38}_{14}Si_{24}$