Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	T. D. Johnson and W. D. Kulp(a)	NDS 129, 1 (2015)	27-Jul-2015

Q(β^-)=7466 *4*; S(n)=3994 *3*; S(p)=14753 *4*; Q(α)=−7875 *3* 2012Wa38

Mass measurement: 2008HA23 (Penning trap, JYFLTRAP at IGISOL), mass excess=−66426.1 *22* keV.

Identification and half-life of ^{87}Se were established mainly via neutron activity of bromine daughter after chemical separation from other ^{235}U fission products, 1993Ru01. Also see 2011SO33 for production using ^{86}Kr (15 MeV/nucleon) + ^{64}Ni.

^{87}Se Levels

Cross Reference (XREF) Flags

A ^{248}Cm SF decay
B ^{87}As β^- decay

E(level)	J$^\pi$ †	T$_{1/2}$	XREF	Comments
0.0	(3/2$^+$)	5.50 s *14*	AB	%β^-= 100; %β^-n=0.36 *8* J$^\pi$: Systematics of the N=53 isotones suggest either 5/2$^+$ or 3//2$^+$. Based on shell model calculations of for the E(5/2$^+$) and E(3/2$^+$) for the N=53 isotones. The calculations indicate large and nearly constant B(E2) values with a significant deformation. Calculations assuming a K=3/2 band were consistent with the excitation levels and B(E2) values, thus placing the 3/2$^+$ spin level below that for 5/2$^+$. See 2013Rz02 for details. with shell model calculations (2013Rz02). T$_{1/2}$: from unweighted average of 5.9 s *2* (1970De08), 5.85 s *15* (1970Kr05), 5.41 s *10* (1971To13, supersedes 1968To06), 5.8 s *3* (1978Ze08) and 5.29 s *11* (1993Ru01) all determined from neutron counting. Other values are: 16 s *3* (1960Sa05) from ^{87}Br grow-in, 5.5 s *2* (1970ToZT, superseded by value from 1971To13), and 5.60 s *16* (1982Ru01, superseded by value from 1993Ru01). %β^-n: from unweighted average of 0.26 *7* (1970De08, Adjusted by 1993Ru01; original was 0.23 *7*), 0.51 *17* and 0.24 *8* (1970Kr05), 0.17 *3* (1971To13, Adjusted by 1993Ru01; original 0.16 *3*), and 0.60 *12* (1993Ru01). The reduced-χ^2 value for this average is 4.02, higher than the critical value 2.37, due to discrepant values. Therefore, an unweighted average is adopted. Other values are: ≤ 0.8 (1968To06); 0.44 *20* (1969WaZS); 0.18 *4* (1970ToZT; see 1971To13 value by same authors); and 0.19 *3* (1982Ru01).
91.9 *2*	(5/2$^+$)		AB	J$^\pi$: Comparison with shell model calculations, see 2013Rz02.
836.5 *3*	(7/2$^+$)		A	
978.1 *3*	(9/2$^+$)		A	

† Suggested values from systematics and comparisons with shell model calculations presented in 2013Rz02.

$\gamma(^{87}Se)$

E$_i$(level)	J$_i^\pi$	E$_\gamma$	I$_\gamma$	E$_f$	J$_f^\pi$	Mult.	Comments
91.9	(5/2$^+$)	91.9 *2*	100	0.0	(3/2$^+$)	M1+E2	Mult.,δ: Based on angular correlations for the 91.9-886.2 keV cascade leading to δ = +0.53 *+31−12* or +5.0 *+162, −27*. Additionally, as B(M2)(W.u.)<1 from RUL, a half life can be calculated for E1+M2, assuming the lowest allowed δ of 0.41, resulting in T$_{1/2}$>27 μs . As this likely would not have been observed, E1+M2 may be excluded.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

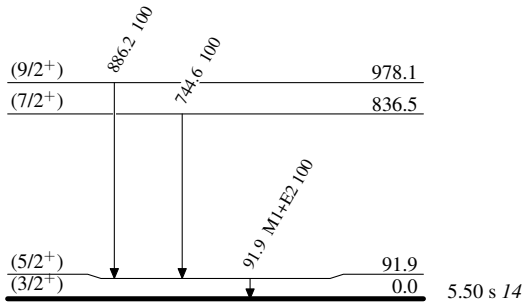
$\gamma(^{87}Se)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π
836.5	$(7/2^+)$	744.6 *2*	100	91.9	$(5/2^+)$
978.1	$(9/2^+)$	886.2 *2*	100	91.9	$(5/2^+)$

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{87}_{34}Se_{53}$