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^-)=6818 *3*; S(n)=6331 *4*; S(p)=10677 *4*; Q(α)=−6647 *4* 2012Wa38
Mass measurement: 2007Ra23 (Penning trap, JYFLTRAP at IGISOL), mass excess=−73892 *4* keV.
All data for excited levels are from ^{87}Se β^- decay (1980Ze04).
See 2013Co15 for production using proton-induced fission of uranium. and 2011So33 for ^{86}Kr (15 MeV/nucleon) on ^{124,112}Sn.
Other theory: 2011Ka28 (calculated decay spectra).

^{87}Br Levels

Cross Reference (XREF) Flags

A ^{87}Se β^- decay

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
0.0	(5/2$^-$)	55.68 s *12*	A	%β^-=100; %β^-n=2.60 *4* Jπ: The shell model indicates that $\pi f_{5/2}$ or $\pi p3/2$ leads to (3/2$^-$,5/2$^-$). Two levels in ^{87}Kr populated in β^- decay are 4710 and 4961. These both have γ transitions to a 9/2$^+$ level at 1578 keV. So the Jπ values for both levels are likely 5/2$^+$ or 7/2$^-$. The logft values for the 4710 and 4961, 5.5 and 5.7 respectively, are both allowed, implying ΔJ=0,1 and Δπ=no. For the ^{87}Br ground state, this leads to 3/2$^+$,5/2$^+$,7/2$^+$ or 5/2$^-$,7/2$^-$,9/2$^-$. Combining with the shell model argument leads to (5/2$^-$). This is the argument presented in 2006Po09. $T_{1/2}$: weighted average of 56.1 s *7* (1949Su14 by the extraction and measurement of ^{87}Kr activity), 55.8 s *3* (1966Si09 by neutron counting), 55.4 s *7* (1966Wi03), 55.60 55.60 s 15 (1971De35 by neutron counting), 56.3 s *5* (1974Gr29 from milking and 4πβ counting), 55.9 s *16* (1974Kr21 by neutron counting), and 55.6 s *3* (1993Ru01 by neutron counting); the associated reduced-χ^2 is 0.43. Other measurements: 54.5 s (1957Ke67 by neutron counting, though will include ^{86}Br as well), 55.4 s *7* (1962Wi20 and 1963Wi02, superseded by 1966Wi03) 55.6 s *3* (1970DeZQ or 1970MaZT, superseded by 1971De35), 56.0 s *3* (1970OsZZ, superseded by 1974Gr29). %β^-n: weighted average of 3.1 *6* (1964Ar24), 3 *1* (1967Ga19), 2.63 *5* (1967Pa26), 2.3 *3* (1971De35), 2.3 *4* (1972Sc48), 2.35 *40* (1975Iz03), 2.6 *4* (1978Kr15), 2.57 *15* (1980Lu04), 2.1 *4* (1980ReZQ, with 10% systematic uncertainties added in quadrature to the reported statistical uncertainty of *3*), and 2.56 *10* (1993Ru01). Others: 2.1 *3* (1970DeZQ, superseded by 1971De35), 2.3 *5* (1974Kr21, superseded by 1978Kr15), 2.16 *33* (1976ReZN, superseded by 1977Re05, 1980Lu04, and 1980ReZQ), 2.56 *38* (1976ShZL), 2.55 *49* (1976NiZZ), 2.5 *3* (1977Re05, superseded by 1980Lu04 and 1980ReZQ).
242.51 *23*	(1/2,3/2,5/2)		A	Jπ: from log *ft*=6.6, log $f^{1u}t$=8.7 from Jπ=(3/2$^+$), γ to Jπ=(5/2$^-$).
334.0 *3*	(1/2,3/2,5/2)		A	Jπ: from log *ft*=6.2, from Jπ=(3/2$^+$), γ to Jπ=(5/2$^-$).
573.17 *24*	(1/2,3/2,5/2)		A	Jπ: from log *ft*=6.6, log $f^{1u}t$=8.6 from Jπ=(3/2$^+$), γ to Jπ=(5/2$^-$).
710.51 *21*	(1/2,3/2,5/2)		A	Jπ: from log *ft*=6.4, log $f^{1u}t$=8.4 from Jπ=(3/2$^+$), γ to Jπ=(5/2$^-$).
1035.5 *6*	(1/2,3/2,5/2)		A	Jπ: from log *ft*=6.9.
1878.14 *21*	(1/2,3/2,5/2)		A	Jπ: from log *ft*=5.9 from Jπ=(3/2$^+$), γ to Jπ=(5/2$^-$).
3926.4 *4*	(1/2,3/2,5/2)		A	Jπ: from log *ft*=5.7 from Jπ=(3/2$^+$), γ to Jπ=(5/2$^-$).
3987.1 *6*	(1/2,3/2,5/2)		A	Jπ: from log *ft*=6.0, log $f^{1u}t$=7.5 from Jπ=(3/2$^+$).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{87}Br Levels (continued)

† From least-squares fit to γ energies.

‡ J^π of excited states determined using log *ft* values and population of levels in decay to ^{87}Kr (2006Po09). Due to incomplete decay scheme, assignments are done with some risk.

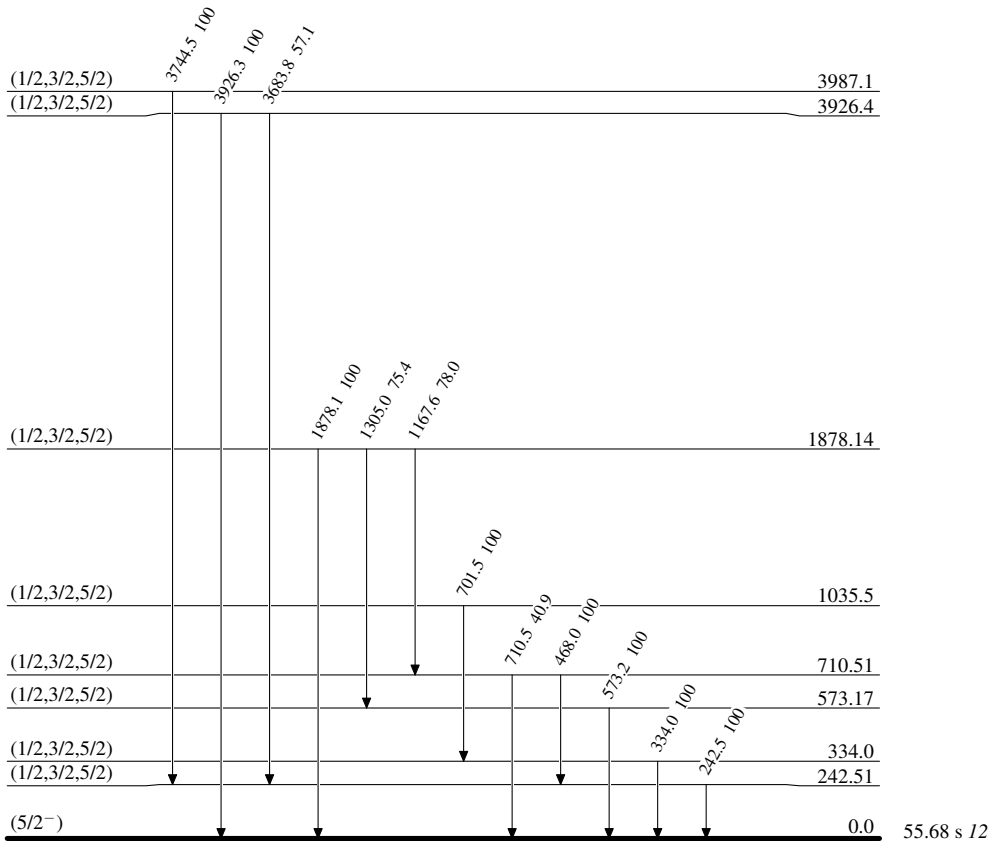
$\gamma(^{87}Br)$

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π
242.51	(1/2,3/2,5/2)	242.5 *3*	100	0.0	(5/2$^-$)
334.0	(1/2,3/2,5/2)	334.0 *3*	100	0.0	(5/2$^-$)
573.17	(1/2,3/2,5/2)	573.2 *3*	100	0.0	(5/2$^-$)
710.51	(1/2,3/2,5/2)	468.0 *3*	100	242.51	(1/2,3/2,5/2)
		710.5 *3*	40.9	0.0	(5/2$^-$)
1035.5	(1/2,3/2,5/2)	701.5 *5*	100	334.0	(1/2,3/2,5/2)
1878.14	(1/2,3/2,5/2)	1167.6 *3*	78.0	710.51	(1/2,3/2,5/2)
		1305.0 *3*	75.4	573.17	(1/2,3/2,5/2)
		1878.1 *3*	100	0.0	(5/2$^-$)
3926.4	(1/2,3/2,5/2)	3683.8 *5*	57.1	242.51	(1/2,3/2,5/2)
		3926.3 *5*	100	0.0	(5/2$^-$)
3987.1	(1/2,3/2,5/2)	3744.5 *5*	100	242.51	(1/2,3/2,5/2)

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{87}_{35}Br_{52}$