

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	30-Nov-2021

$Q(\beta^-)=8262$ 4; $S(n)=5630$ 5; $S(p)=11679$ 5; $Q(\alpha)=-7510$ 4 (2021Wa16)

$Q(\beta^-n)=3346$ 4, $S(2n)=10525$ 5, $S(2p)=27234$ 4 (2021Wa16).

^{89}Br produced and identified in fission of ^{235}U together with the measurement of half-life (1947Re02,1948Hu33,1959Pe28). Later studies of ^{89}Br decay: 1966Si09, 1971Ch38, 1971Kr22, 1984Ew01, 1974Gr29, 1976Ru01, 1981Ho17, 1993Ru01 and several others with an interest in beta-delayed neutron decay of this isotope.

Mass measurements: 2008Su19, 2007Ra23 (JYFLTRAP, Penning-trap method at IGISOL facility in Jyvaskyla).

Additional information 1.

Theoretical calculations: consult NSR database at www.nndc.bnl.gov/nsr/ or additional document records in this dataset for 14 primary references for half-life and β^-n decay mode of ^{89}Br .

 ^{89}Br LevelsCross Reference (XREF) Flags

- A** ^{89}Se β^- decay (0.43 s)
B $^{235}\text{U}(n,\text{F}\gamma)$

E(level) [†]	J^π [†]	$T_{1/2}$	XREF	Comments
0	(5/2 ⁻)	4.357 s 22	AB	$\% \beta^- = 100$; $\% \beta^-n = 13.7$ 6 $\% \beta^-n$: from 2020Li32 evaluation based on weighted average of 13.4 6 (1993Ru01); 14.6 13 (1987PfZX); 13.6 8 (1984Ew01); 13.9 14 (1981Ho07); 13.9 14 (1980ReZQ). Others: 2004PiZZ, 14.2 9 (1980Al15); 13.9 8 (1980Lu04); 12.5 20 (1978Kr15); 16.9 17 (1977Re06,1977Re05); 16.6 25 (1976ReZN); 13.2 21 (1974Kr21); 13.5 25 (1972Sc48), 7 2 (1964Ar24); 2004PiZZ, 1981Ho17, 1976Ru01, 1975Al11, 1974Ru07, 1974NoZR, 1971Ch38, 1966Si09, 1965Sh07, 1964Ar24, 1959Pe28, 1949Su14, 1948Hu33, 1947Re02. J^π : from shell-model predictions (2021Ny02) and analogy with experimental level structure of ^{87}Br and ground states of other Br isotopes. 1/2 ⁺ proposed in theoretical calculations (2019Mo01). $T_{1/2}$: from decay curves for neutrons, weighted average of 4.348 s 22 (1993Ru01) 4.37 s 3 (1976Ru01), 4.55 s 10 (1974Gr29,1970OsZZ), 4.30 s 14 (1984Ew01), 4.44 s 20 (1974Kr21,1975Kr17,1971Kr22) and 4.32 s 5 (1974NoZR). Others: 4.5 s (1971Ch38), 1971BrYH, 4.5 s 8 (1966Si09, also 1971To13), 4.4 s 5 (1959Pe28), 4.51 s 10 (1948Hu33), 4.45 s 15 (1947Re02), 4.4 s (Snell et al., Phys Rev 72, 541 (1947)). Additional information 2. XREF: A(?).
130.3 3	(3/2 ⁻)		AB	
506.7 3	(7/2 ⁻)		B	
531.5 3	(5/2 ⁻)		B	
953.4 3	(7/2 ⁻)		B	
1545.9 [‡] 4	(9/2 ⁺)		B	
2136.6 [‡] 5	(13/2 ⁺)		B	
3035.2 [‡] 7	(17/2 ⁺)		B	
3778.1 7	(19/2 ⁺)		B	
4031.7 [‡] 7	(21/2 ⁺)		B	
4857.6 9	(23/2 ⁺)		B	

[†] From $^{235}\text{U}(n,\text{F}\gamma)$ (2021Ny02). Spin-parity assignments in 2021Ny02 are based on comparison of experimental level scheme of

Adopted Levels, Gammas (continued) ^{89}Br Levels (continued)

^{87}Br investigated in [2021Ny01](#), and shell model calculations in [2021Ny02](#).

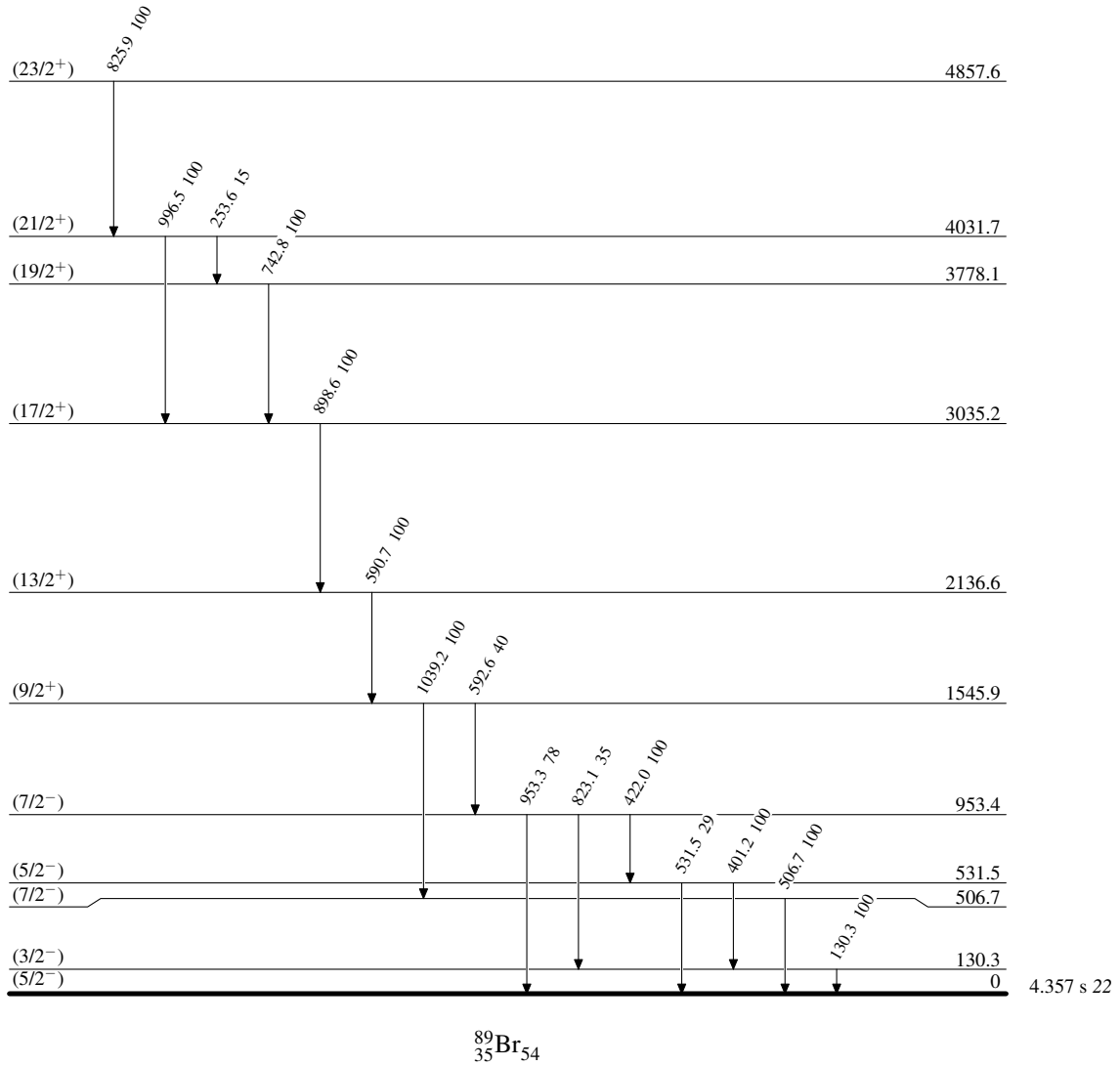
‡ Band(A): $\pi g_{9/2}$ band.

$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	$\gamma(^{89}\text{Br})$
						Comments
130.3	(3/2 ⁻)	130.3 3	100	0	(5/2 ⁻)	E_γ : other: 130.0 19 in ^{89}Se β^- decay (1982Re08).
506.7	(7/2 ⁻)	506.7 3	100	0	(5/2 ⁻)	
531.5	(5/2 ⁻)	401.2 3	100 29	130.3	(3/2 ⁻)	
		531.5 3	29 13	0	(5/2 ⁻)	
953.4	(7/2 ⁻)	422.0 3	100 15	531.5	(5/2 ⁻)	
		823.1 4	35 15	130.3	(3/2 ⁻)	
		953.3 5	78 15	0	(5/2 ⁻)	
1545.9	(9/2 ⁺)	592.6 8	40 9	953.4	(7/2 ⁻)	
		1039.2 4	100 9	506.7	(7/2 ⁻)	
2136.6	(13/2 ⁺)	590.7 3	100	1545.9	(9/2 ⁺)	
3035.2	(17/2 ⁺)	898.6 4	100	2136.6	(13/2 ⁺)	
3778.1	(19/2 ⁺)	742.8 4	100	3035.2	(17/2 ⁺)	
4031.7	(21/2 ⁺)	253.6 6	15 8	3778.1	(19/2 ⁺)	
		996.5 4	100 23	3035.2	(17/2 ⁺)	
4857.6	(23/2 ⁺)	825.9 5	100	4031.7	(21/2 ⁺)	

† From $^{235}\text{U}(n,\text{F}\gamma)$ ([2021Ny02](#)).

Adopted Levels, GammasLevel Scheme

Intensities: Relative photon branching from each level



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