^{207}Bi IT decay (182 μs) 1969Be47,1972Ma24,1978Lo12

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev, S. Lalkovski	NDS 112, 707 (2011)	1-Aug-2010

Parent: ^{207}Bi: E=2101.39 *17*; $J^\pi=21/2^+$; $T_{1/2}$=182 μs *6*; %IT decay=100.0

1978Lo12, 1979Lo04: Pulsed beam, E(α)=30-43 MeV, E(d)=25 MeV; γGe(Li), ce Si(Li); γγ coin, γ(θ), γ(t);

1969Be47: Pulsed beam, E(α)=28 MeV; Target: 10 mg/cm^2 $^{205}Tl_2O_3$ sandwiched between 100 μg/cm^2 thick foils; Detectors: two Ge(Li); Measured: Eγ, Iγ, γ(t).

1972Ma24: Isomeric state produced in ^{204}Hg(^{7}Li,4nγ) reaction; Pulsed beam, E(^{7}Li)=41 MeV; Target: 80 mg liquid mercury enriched to 80% in ^{204}Hg; two planar Ge(Li) detectors, magnet; Measured: Eγ, Iγ, γ(θ,H,t), g-factor.

Others: 1998Pf02, 1979Lo04, 1967Co20.

I(Kα x ray)/I(669γ)=1.05 (1967Co20).

^{207}Bi Levels

E(level)†	J^π‡	$T_{1/2}$‡	Comments
0.0	$9/2^-$	31.55 y *4*	configuration: $\pi(1h^{+1}_{9/2})\otimes 0^+_1$.
669.52 *9*	$11/2^-$		configuration: $\pi(1h^{+1}_{9/2})\otimes 2^+_1$.
931.78 *11*	$13/2^-$		configuration: $\pi(1h^{+1}_{9/2})\otimes 2^+_1$.
1240.45 *12*	$13/2^-$		configuration: $\pi(1h^{+1}_{9/2})\otimes 3^+_1$.
1358.04 *18*	$15/2^-$		configuration: $\pi(1h^{+1}_{9/2})\otimes 3^+_1$.
1645.31 *16*	$15/2^-$		configuration: $\pi(1h^{+1}_{9/2})\otimes\nu(f^{-2}_{5/2})_{3^+}$.
2101.39 *17*	$21/2^+$	182 μs *6*	$T_{1/2}$: From γ(t) in 1969Be47. Other: 174 μs *20* (1967Co20). μ: +3.43 *4* from g=+0.327 *4*, weighted average of g=+0.325 *6* (1972Ma24) and 0.329 *5* (1974PrZF). configuration: $\pi(1h^{+1}_{9/2})\otimes\nu(p^{-1}_{1/2},i^{-1}_{13/2})_{6^-}$.

† From a least-squares fit to Eγ.

‡ From Adopted Levels, unless otherwise stated.

γ(^{207}Bi)

Iγ normalization: From Σ Ti(g.s.)=100. Note that this condition gives Σ Ti(from isomer)=97 *12*.

E_γ†	I_γ†#	E_i(level)	J^π_i	E_f	J^π_f	Mult.‡	δ‡	α@	Comments
117.9 *4*	2.5 *4*	1358.04	$15/2^-$	1240.45	$13/2^-$	M1+E2	−0.06 *4*	6.36 *11*	α(K)=5.16 *10*; α(L)=0.914 *18*; α(M)=0.215 *5*; α(N+..)=0.0676 *14* α(N)=0.0551 *11*; α(O)=0.01124 *22*; α(P)=0.001334 *24*
x238 *1*	2.5 *10*								Eγ: Tentative line, observed in 1969Be47 with Iγ=2.5 *10* and suggested to be a decay branch from the isomeric state in order to account for the intensity imbalance. However, the final state at 1863 keV has not been observed.
262.2 *1*	23 *3*	931.78	$13/2^-$	669.52	$11/2^-$	M1+E2	−0.03 *2*	0.671	α(K)=0.547 *8*; α(L)=0.0948 *14*; α(M)=0.0223 *4*; α(N+..)=0.00700 *10* α(N)=0.00570 *8*; α(O)=0.001165 *17*; α(P)=0.0001387 *20*
288	≤1	1645.31	$15/2^-$	1358.04	$15/2^-$	[M1]			Iγ: From 1972Ma24; shows the 182 μs half-life.
308.6 *2*	2.5 *7*	1240.45	$13/2^-$	931.78	$13/2^-$	M1(+E2)	−0.03 *5*	0.429 *7*	α(K)=0.350 *6*; α(L)=0.0605 *9*;

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^{207}Bi IT decay (182 μs) 1969Be47,1972Ma24,1978Lo12 (continued)

γ(^{207}Bi) (continued)

E_γ[†]	I_γ[†#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	α[@]	Comments
									α(M)=0.01420 *21*; α(N+..)=0.00446 *7* α(N)=0.00363 *6*; α(O)=0.000742 *11*; α(P)=8.84×10^{-5} *13*
405.0 *2*	4.2 *8*	1645.31	15/2$^-$	1240.45	13/2$^-$	M1+E2	−0.15 *4*	0.202 *4*	α(K)=0.165 *3*; α(L)=0.0285 *5*; α(M)=0.00669 *11*; α(N+..)=0.00210 *4* α(N)=0.00171 *3*; α(O)=0.000349 *6*; α(P)=4.16×10^{-5} *7*
426.1 *2*	14 *2*	1358.04	15/2$^-$	931.78	13/2$^-$	M1+E2	−0.10 *5*	0.178 *3*	α(K)=0.1455 *25*; α(L)=0.0250 *4*; α(M)=0.00586 *9*; α(N+..)=0.00184 *3* α(N)=0.001500 *23*; α(O)=0.000306 *5*; α(P)=3.65×10^{-5} *6*
456.1 *1*	49 *5*	2101.39	21/2$^+$	1645.31	15/2$^-$	E3		0.1395	α(K)=0.0662 *10*; α(L)=0.0545 *8*; α(M)=0.01436 *21*; α(N+..)=0.00445 *7* α(N)=0.00368 *6*; α(O)=0.000702 *10*; α(P)=6.32×10^{-5} *9*
571.0 *1*	16 *2*	1240.45	13/2$^-$	669.52	11/2$^-$	M1+E2	−0.20 *5*	0.0802 *17*	α(K)=0.0656 *14*; α(L)=0.01121 *21*; α(M)=0.00263 *5*; α(N+..)=0.000826 *16* α(N)=0.000672 *13*; α(O)=0.000137 *3*; α(P)=1.63×10^{-5} *4*
669.5 *1*	62 *6*	669.52	11/2$^-$	0.0	9/2$^-$	M1+E2	+0.24 *4*	0.0523 *11*	α(K)=0.0427 *9*; α(L)=0.00728 *14*; α(M)=0.00171 *3*; α(N+..)=0.000536 *10* α(N)=0.000436 *8*; α(O)=8.92×10^{-5} *16*; α(P)=1.061×10^{-5} *20*
713.5 *2*	39 *4*	1645.31	15/2$^-$	931.78	13/2$^-$	M1(+E2)	−0.03 *4*	0.0460	α(K)=0.0377 *6*; α(L)=0.00636 *9*; α(M)=0.001490 *22*; α(N+..)=0.000468 *7* α(N)=0.000381 *6*; α(O)=7.79×10^{-5} *11*; α(P)=9.30×10^{-6} *14*
743.30 *15*	37 *4*	2101.39	21/2$^+$	1358.04	15/2$^-$	E3		0.0335	α(K)=0.0223 *4*; α(L)=0.00844 *12*; α(M)=0.00214 *3*; α(N+..)=0.000666 *10* α(N)=0.000548 *8*; α(O)=0.0001070 *15*; α(P)=1.069×10^{-5} *15*
931.8 *2*	29 *3*	931.78	13/2$^-$	0.0	9/2$^-$	E2		0.00803 *12*	I_γ: The value Iγ=21 of 1978Lo12 (from Iγ/Iγ(669γ)=0.35) is inconsistent with spectra of 1972Ma24 and 1979Lo04. The authors′ value may be a misprint. A ratio of 0.55 would give good agreement. α=0.00803 *12*; α(K)=0.00633 *9*; α(L)=0.001299 *19*; α(M)=0.000312 *5*; α(N+..)=9.72×10^{-5} *14*

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^{207}Bi IT decay (182 μs) 1969Be47,1972Ma24,1978Lo12 (continued)

$\gamma(^{207}Bi)$ (continued)

E_γ[†]	I_γ[†#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[@]	Comments
								α(N)=7.95×10^{-5} *12*; α(O)=1.590×10^{-5} *23*; α(P)=1.756×10^{-6} *25*
975.6 *4*	7 *2*	1645.31	15/2$^-$	669.52	11/2$^-$	E2	0.00734 *11*	α=0.00734 *11*; α(K)=0.00581 *9*; α(L)=0.001167 *17*; α(M)=0.000279 *4*; α(N+..)=8.71×10^{-5} *13*
								α(N)=7.13×10^{-5} *10*; α(O)=1.427×10^{-5} *20*; α(P)=1.586×10^{-6} *23*
1240.9 *7*	2.3 *5*	1240.45	13/2$^-$	0.0	9/2$^-$	E2	0.00464 *7*	α=0.00464 *7*; α(K)=0.00374 *6*; α(L)=0.000684 *10*; α(M)=0.0001619 *23*; α(N+..)=5.83×10^{-5} *9*
								α(N)=4.13×10^{-5} *6*; α(O)=8.34×10^{-6} *12*; α(P)=9.51×10^{-7} *14*; α(IPF)=7.74×10^{-6} *14*
								I_γ: Iγ(delayed)=3 (1978Lo12) and 8 *5* (1969Be47).
								Mult.: A_2=0.23 *7*, A_4=0.08 *6*.
								I_γ: From unweighted average of Iγ/Iγ(571γ)=0.17 (1978Lo12 prompt spectrum) and 0.12 (1978Lo12 delayed spectrum). Note that Iγ/Iγ(571γ)=0.56 *14* in 1969Be47.

† From 1969Be47, unless otherwise stated.
‡ From adopted gammas.
# For absolute intensity per 100 decays, multiply by 1.03 *10*.
@ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
x γ ray not placed in level scheme.

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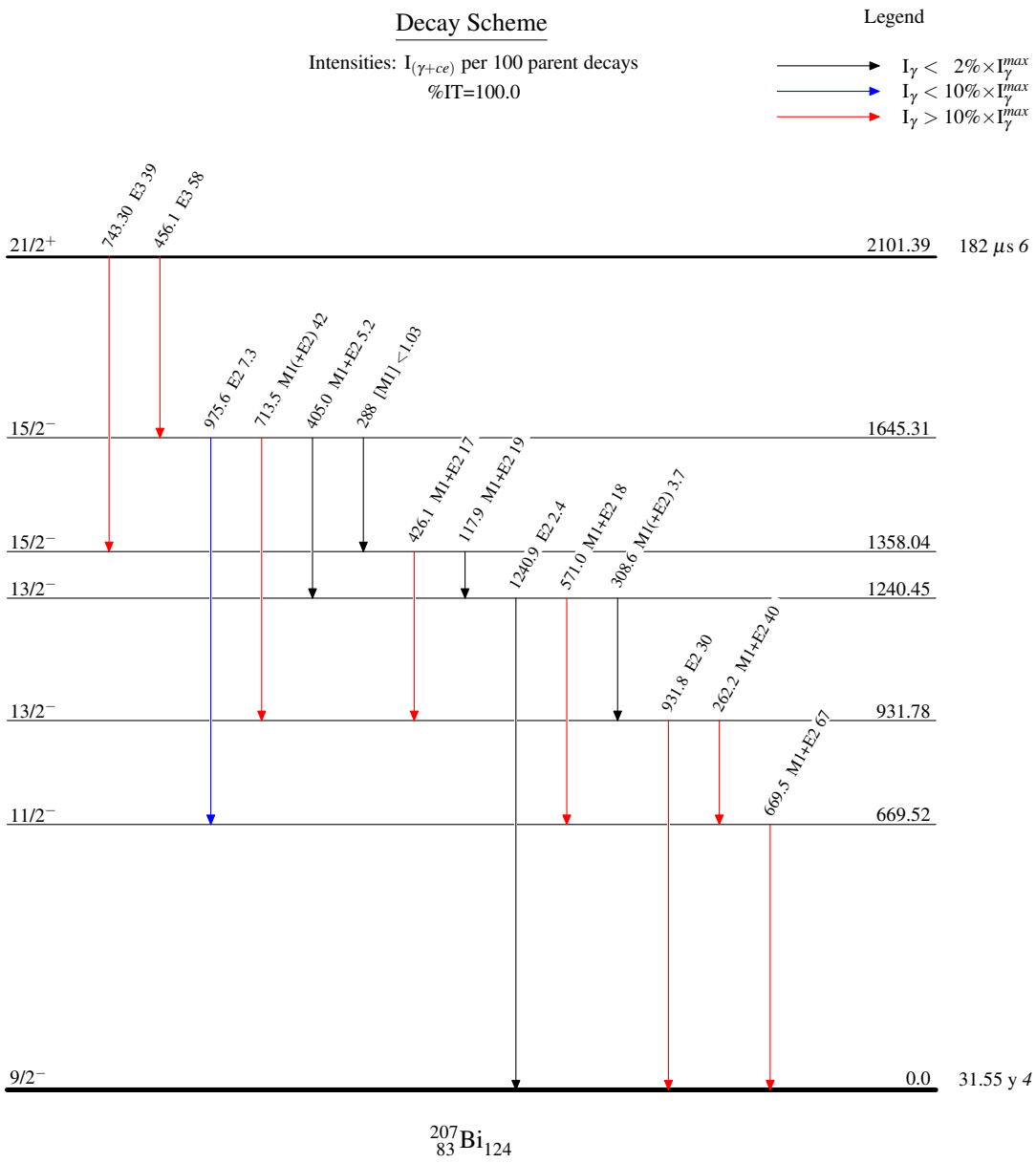

$^{207}_{83}Bi_{124}$