^{208}Pb(α,4nγ)

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. J. Martin	NDS 108,1583 (2007)	1-Jun-2007

1967Ya01 E=50 MeV.
1968Tr06 E=48 MeV.
1974Wi20 E=42-51 MeV.
1975WeZX E=51 MeV.
1977LiYQ.
1978Be39 E=41-51 MeV. Data given below were obtained At E=51.

The decay scheme is that of 1978Be39, except As follows. 1978Be39 place the 761.3γ As feeding the 3399.6, defining a level At 4160.9. From (^{9}Be,5nγ), 1997Po04 show that the 761.4γ feeds the 3545.4 level, defining a level At 4306.7. 1978Be39 place the 159.6γ feeding the 4918.1 level, defining a level At 5077.7. 1997Po04 show that this transition feeds the 5201.4 level, defining a level At 5262.0.

^{208}Po Levels

E(level)	J$^{\pi}$ †	T$_{1/2}$	Comments
0.0	0$^+$		
686.5 *1*	2$^+$		
1346.5 *2*	4$^+$		
1524.0 *2*	6$^+$		
1528.0 *2*	8$^+$		
2159.8 *2*	8$^+$‡		
2240.6 *2*	9$^+$		
2369.0 *2*	7$^-$‡		
2554.3 *2*	10$^+$		
2702.8 *2*	11$^-$	8 ns *2*	g=1.12 *4* T$_{1/2}$: from α,147γ(t) (1967Ya01). g-factor: from (712γ)(θ,H,t) (1975WeZX). This value is corrected for diamagnetism (−1.9% 2) and Knight shift (1.4% 5) (see 1976Ha56).
2799.9 *3*	9$^-$‡		
3399.6 *3*	12$^-$		
3545.4 *3*	13$^-$		
3899.9 *3*	(11,12,13)$^-$		
4057.2 *3*	14$^-$		
4061.8 *3*	15$^-$		
4306.7 *3*			
4660.4 *3*	15$^-$		
4918.1 *3*	16$^+$		
5102.4 *3*			
5116.9 *3*	17$^+$		
5262.0 *3*			
5406.7 *3*			
5475.2 *3*	18$^+$		
5900.0 *4*	19$^+$		

† Except where noted otherwise, the J$^{\pi}$ assignments are from 1978Be39 based on γ mult, σ(E), and $\gamma(\theta)$.
‡ From Adopted Levels.

^{208}Pb(α,4nγ) (continued)

$\gamma(^{208}Po)$

$\gamma(\theta)$: see 1978Be39, 1968Tr06, and 1977LiYQ. Data of 1968Tr06 for the 177, 660, and 685 γ's are consistent only with the spin sequence 6(Q)4(Q)2(Q)0 from the 1524 level.

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [@]	δ [@]	α [&]	Comments
(4.02 *3*)		1528.0	8^+	1524.0	6^+	E2			E_γ,Mult.: from ^{208}At ε decay.
145.8 *1*	11	3545.4	13^-	3399.6	12^-	M1		3.96	Mult.: α(L)exp=0.40 *8*.
148.5 *1*	44	2702.8	11^-	2554.3	10^+	E1		0.172	Mult.: α(L)exp=0.023 *17*.
159.6 *1*	1.5	5262.0		5102.4		M1		3.06	Mult.: α(L)exp=0.7 (1978Be39) allows mult=E1, E2, or M1. $\gamma(\theta)$ rules out mult=Q. Mult=M1 from Adopted Gammas.
177.5 *1*	59	1524.0	6^+	1346.5	4^+	E2		0.736	Mult.: α(L)exp=0.36 *5*.
184.3 *1*	6.0	5102.4		4918.1	16^+				
198.8 *1*	7.0	5116.9	17^+	4918.1	16^+	M1		1.65	Mult.: α(L)exp=0.31 *5*.
257.7 *1*	5.0	4918.1	16^+	4660.4	15^-	E1		0.045	Mult.: α(L)exp=0.04. $\gamma(\theta)$ gives mult=d.
313.7 *1*	24	2554.3	10^+	2240.6	9^+	M1+E2	−0.09 *1*	0.465 *1*	Mult.: α(K)exp=0.40 *6*. δ: from $\gamma(\theta)$ (1978Be39). Uncertainty of 10% assigned by the evaluator.
358.3 *1*	5.3	5475.2	18^+	5116.9	17^+	M1(+E2)	−0.03 *3*	0.326	Mult.: α(K)exp=0.38 *8*. δ: δ=−0.04 from $\gamma(\theta)$ (1978Be39).
424.8 *1*	3.4	5900.0	19^+	5475.2	18^+	M1(+E2)	−0.09 *9*	0.206	Mult.: α(K)exp=0.25 *5*.
430.9 *1*	2.5	2799.9	9^-	2369.0	7^-	E2		0.0469	
488.6 *1*	2.0	5406.7		4918.1	16^+	M1		0.142	Mult.: α(K)exp=0.13 *5*.
500.3 *1*	5.0	3899.9	$(11,12,13)^-$	3399.6	12^-	M1		0.133	Mult.: α(K)exp=0.12 *3*.
511.8 *1*	24	4057.2	14^-	3545.4	13^-	M1+E2	≤0.81	0.107 *19*	Mult.: α(K)exp=0.10 *3*.
516.4 *1*	18	4061.8	15^-	3545.4	13^-	E2		0.0300	Mult.: α(K)exp=0.038 *7*.
603.1 *1*	7.0 [#]	4660.4	15^-	4057.2	14^-	M1(+E2)	−0.03 *3*	0.082	
631.8 *1*	4.6	2159.8	8^+	1528.0	8^+	M1+E2	0.42 *11*	0.064 *3*	
660.0 *1*	98	1346.5	4^+	686.5	2^+	E2		0.0173	Mult.: α(K)exp=0.013 *2*.
686.5 *1*	100	686.5	2^+	0.0	0^+	E2		0.0159	
696.8 *1*	54	3399.6	12^-	2702.8	11^-	M1+E2	−0.21 *5*	0.0542 *8*	δ: δ=−0.29 from $\gamma(\theta)$ (1978Be39).
712.5 *1*	33	2240.6	9^+	1528.0	8^+	M1+E2	−0.29 *18*	0.049 *3*	Mult.: α(K)exp=0.052 *8*. δ: δ=−0.40 from $\gamma(\theta)$ (1978Be39).
761.3 *1*	3.0	4306.7		3545.4	13^-				
845.0 *1*	4.5	2369.0	7^-	1524.0	6^+	E1		0.00371	
856.3 *1*	23	4918.1	16^+	4061.8	15^-	E1		0.0036	Mult.: mult=E2 from α(K). $\gamma(\theta)$ suggests the transition is dipole. 1978Be39 assign mult=E1 and suggest large α(K) is due to an impurity peak of unknown origin lying just above the 856γ and barely discernible In a high-resolution spectrum. Mult=E1 from Adopted Gammas.
1026.3 *1*	21	2554.3	10^+	1528.0	8^+	E2		0.0071	Mult.: α(K)exp=0.0053 *9*.
1174.8 *1*	19	2702.8	11^-	1528.0	8^+	E3		0.0119	Mult.: α(K)exp=0.0094 *15*.

Continued on next page (footnotes at end of table)

^{208}Pb(α,4nγ) (continued)

$\gamma(^{208}Po)$ (continued)

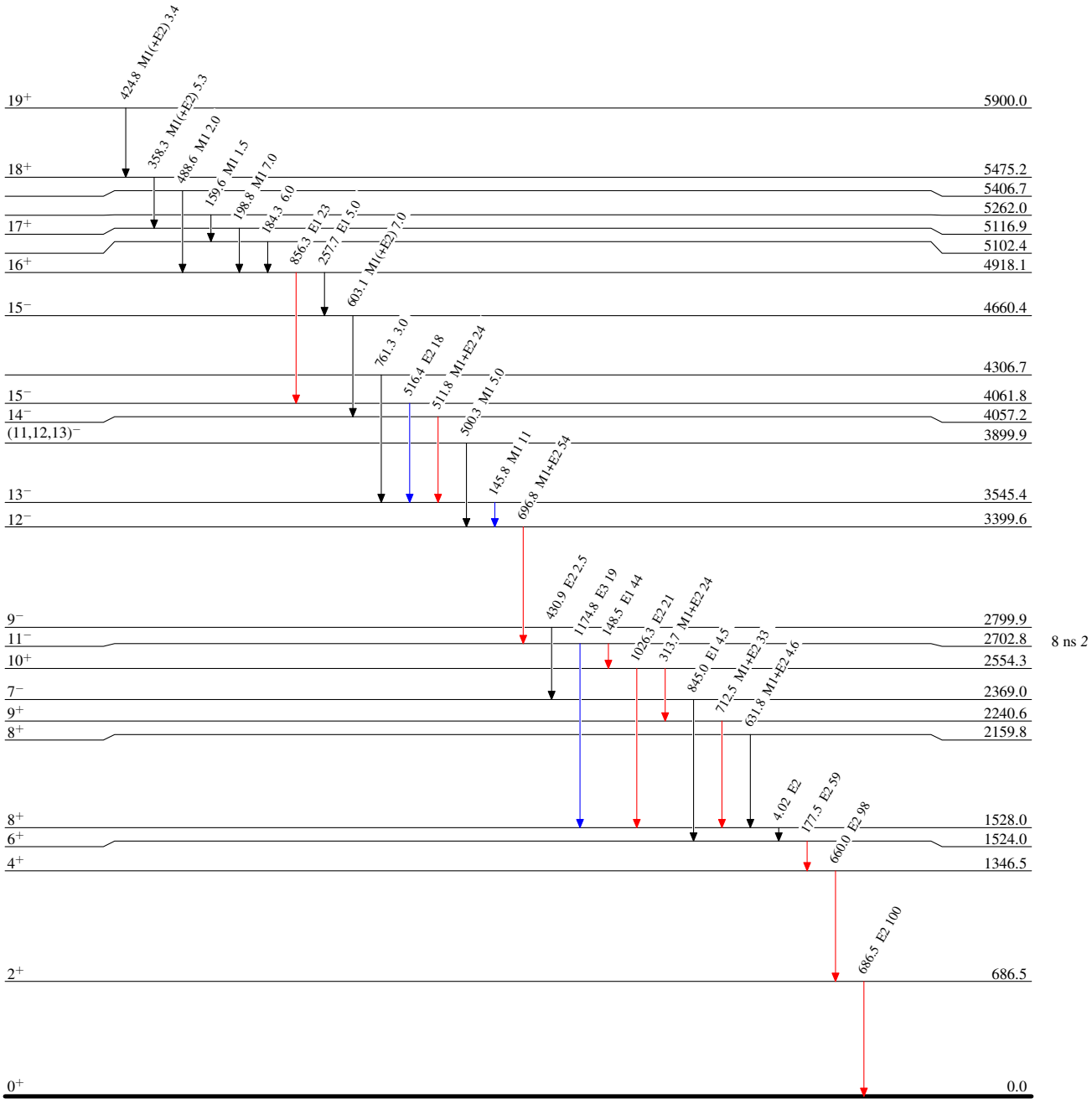
† From 1978Be39. Others: 1974Wi20, 1967Ya01.
‡ From 1978Be39. Data are relative prompt I(γ).
# Corrected for contribution from 603γ In ^{209}Po.
@ From Adopted Gammas. α(K)exp and α(L)exp data of 1978Be39, given here, are based on α(K)exp and α(L)exp from I(ce)/I(γ) (normalized so that α(K)(686.5γ)=0.0119 (E2 theory)). δ data of 1978Be39, from $\gamma(\theta)$ are given In comments. Note that the adopted value of δ for the 313.7γ is from this dataset.
& 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.

^{208}Pb(α,4nγ)

Level Scheme

Intensities: Relative I_γ

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



$^{208}_{84}Po_{124}$