^{208}Pb(^{12}C,^{8}Beγ) 2016Ko03,2017Ko38

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	K. Auranen and E. A. Mccutchan	NDS 168, 117 (2020)	1-Aug-2020

2016Ko03: the nuclei of interest were produced in a ^{208}Pb(^{12}C,^{8}Beγ) α-transfer reaction. The 10-mg/cm^2 thick target (99.14% enrichment) was bombarded with the ^{12}C beam, provided by the FM tandem accelerator of University of Cologne, at the energy of 62 MeV. Eγ, Iγ was measured with 12 HPGe detectors, in coincidence with the outgoing particle, observed in an array of solar cells. Mean lifetimes of excited states were determined with the doppler shift attenuation method.

2017Ko38: the nuclei of interest were produced in a ^{208}Pb(^{12}C,^{8}Beγ) α-transfer reaction. The 0.6-mg/cm^2 thick target had a 2-mg/cm^2 thick Au backing facing the beam. The ^{12}C beam was delivered by the FM tandem accelerator of University of Cologne, and it had an energy of ≈62 MeV. An array of six solar cells were used to detect the outgoing particle. Eγ, Iγ were measured with 11 HPGe detectors, five placed at the angle of 142° and six at 45°. A plunger device was employed to measure the lifetimes of excited states using the recoil-distance Doppler shift method with six stopper distances (25, 35, 43, 55, 70, and 100 μm).

2016Ko03: γ rays with the following energies were observed, and assigned to ^{212}Po, but details are not given: 223, 276, 357, 359, 405, 432, 466, 511, 612, 661, 727, 810, 873, and 971 keV. Evaluators place these in the level scheme based on the Adopted Levels and Gammas.

^{212}Po Levels

E(level)†	J$^\pi$†	T$_{1/2}$	Comments
0.0	0$^+$		
727	2$^+$	14.2 ps *18*	T$_{1/2}$: from RDDS (2017Ko38), average of two limits 15.1 ps *13* (13.3 ps *12*), extracted as a weighted average of lifetimes obtained from forward and backward detectors, assuming fast (slow) feeding from the 3$^-$ state, see 2017Ko38 for details. Evaluators adopted value recommended by 2017Ko38, where the uncertainty is larger than either input value which might reflect additional systematic uncertainties.
1133	4$^+$		
1356	6$^+$		
1476?	8$^+$		E(level): depopulating transition of 120 keV is not discernible in Fig. 1 of 2016Ko03, however, observed 10$^+$ to 8$^+$ transition would suggest that the 8$^+$ yrast level is populated.
1513	2$^+$	0.49 ps *6*	T$_{1/2}$: from DSAM (2016Ko03), evaluators adopt value recommended by 2016Ko03 which appears to be average of 0.506 ps *49* (analysis-I) and 0.478 ps *42* (analysis-II) with larger uncertainty than either input value which might reflect additional systematic uncertainties.
1537	3		
1680	2$^+$	0.54 ps *6*	T$_{1/2}$: from DSAM (2016Ko03), evaluators adopt value recommended by 2016Ko03 which appears to be average of 0.568 ps *28* (analysis-I) and 0.513 ps *49* (analysis-II) with larger uncertainty than either input value which might reflect additional systematic uncertainties.
1744	(4$^-$)		
1753	(8$^-$)		
1788	(6$^-$)		
1834	10$^+$		
1988	(8)		
2003	4$^{(-)}$		
2017	(6)	0.333 ps *28*	T$_{1/2}$: weighted average of 0.347 ps *28* (analysis-I) and 0.319 ps *28* (analysis-II), both from line shape analysis of 661γ (2016Ko03); uncertainty taken as lowest input value.
2103	5		
2229	7		
2375	7		

† From the Adopted Levels.

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$\gamma(^{212}Po)$

E_γ †	E_i(level)	J_i^π	E_f	J_f^π	E_γ †	E_i(level)	J_i^π	E_f	J_f^π	E_γ †	E_i(level)	J_i^π	E_f	J_f^π
(120)	1476?	8^+	1356	6^+	466	2003	$4^{(-)}$	1537	3	873	2229	7	1356	6^+
223	1356	6^+	1133	4^+	511	1988	(8)	1476?	8^+	952	1680	2^+	727	2^+
276	1753	(8^-)	1476?	8^+	612	1744	(4^-)	1133	4^+	971	2103	5	1133	4^+
357	1834	10^+	1476?	8^+	661	2017	(6)	1356	6^+	1513	1513	2^+	0.0	0^+
359	2375	7	2017	(6)	727	727	2^+	0.0	0^+	1680	1680	2^+	0.0	0^+
405	1133	4^+	727	2^+	785	1513	2^+	727	2^+					
432	1788	(6^-)	1356	6^+	810	1537	3	727	2^+					

† From the Adopted Levels, except where noted.

Legend

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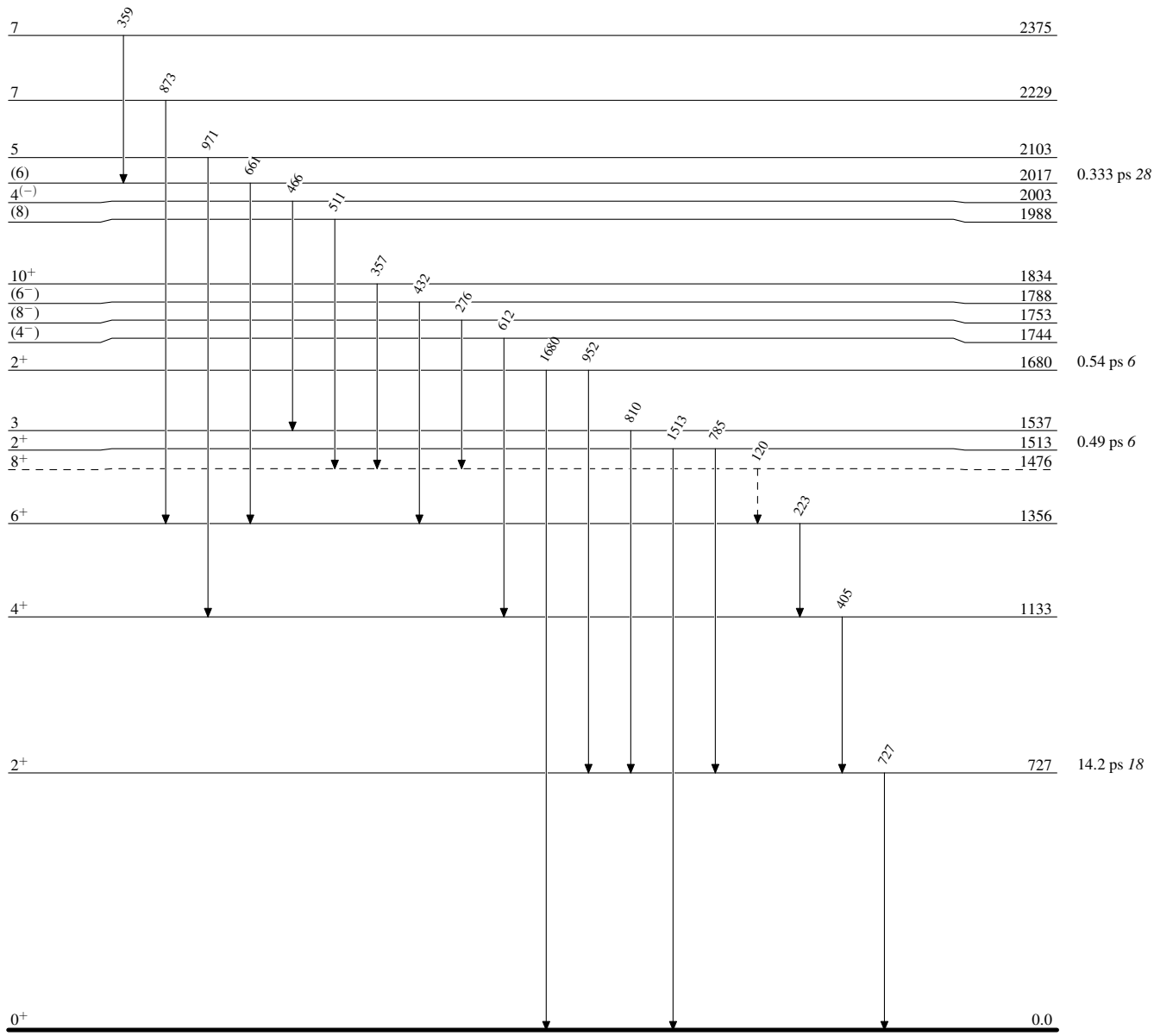
Level Scheme

γ Decay (Uncertain)



$^{212}_{84}Po_{128}$