^{181}Pb α decay 2009An20,2005CaZV

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 159, 1 (2019)	30-Aug-2019

Parent: ^{181}Pb: E=0.0; J^π=(9/2$^-$); $T_{1/2}$=39.6 ms *9*; Q(α)=7240 *7*; %α decay=100.0

^{181}Pb-J^π: From 2005CaZV and 2005Ca43.

^{181}Pb-$T_{1/2}$: From α(t) in 2005CaZV. Others: 36 ms *2* (2009An20), 45 ms *20* (1996To01) and 50 ms *+40−30* (1989To01).

^{181}Pb-Q(α) from 2017Wa10.

2009An20: Source produced using the ^{144}Sm(^{40}Ca,3n) reaction at E(^{40}Ca)=196 MeV. Enriched 96.4% in ^{144}Sm target. Detectors: velocity filter SHIP at GSI, position-sensitive silicon detector (PSDD) with Δ E≈25 keV FWHM, a fourfold segmented clover Ge detector behind the PSDD. Measured: time correlated Eα, Iα, $T_{1/2}$, recoil-$\alpha\alpha$, and recoil-$\alpha\gamma$ coin.

2005CaZV: Source produced using the ^{92}Mo(^{90}Zr,n) reaction at E(^{90}Zr)=385 MeV. Detectors: Argonne Fragment Mass Analyzer, Parallel Grid Avalanche Counter, 48x48 strips Double-sided Silicon Strip Detector (DSSD), four Ge detectors surrounding the DSSD at the focal plane. Measured: Eα, Iα, $T_{1/2}$, recoil-$\alpha\alpha$(t), and recoil-$\alpha\gamma$(t) coin.

Others: 2005Ca43 (same as 2005CaZV, 2005CaZY), 1996To01, 1989To01 and 1986Ke03.

^{177}Hg Levels

E(level)†	J^π‡	$T_{1/2}$‡	Comments
0.0	7/2$^-$	117 ms *7*	%α=100 %α: 100 *5* in 2009An20 from comparison of the number of α_1(6990-7100 keV, ^{181}Pb) decays and the number of α_1(6990-7100 keV, ^{181}Pb)-α_2(6582 keV,^{177}Hg) correlated decays. Eα=6582 keV *15* (2009An20), 6580 keV *5* (2004GoZZ), 6580 keV *8* (1979Ha10), 6577 keV *9* (1996Pa01) and 6580 keV (1991Se01).
77.2 *5*	9/2$^-$		

† From Eγ.
‡ From Adopted Levels.

α radiations

Eα	E(level)	Iα†#	HF‡	Comments
6996 *15*				Eα: From 2009An20, but not placed in the decay scheme. Observed in coincidence with 77γ and showed a 30 ms *10* half-life component.
7004 *7*	77.2	100	1.55 *16*	Eα: from Q(α) (2017Wa10) and 77.2 keV *5* for the excitation energy of the (9/2$^-$) level. Measured Eα=7015 keV *10* (2005CaZV) and 7016 keV *15* (2009An20), 7065 *20* (1996To01), 7044 keV *15* (1989To01) and 7052 keV *10* (1986Ke03).
7093 *20*	0.0	<5	>50	Eα: From 2009An20. Obscured by summations of 7016α and K- and L-shell CE.

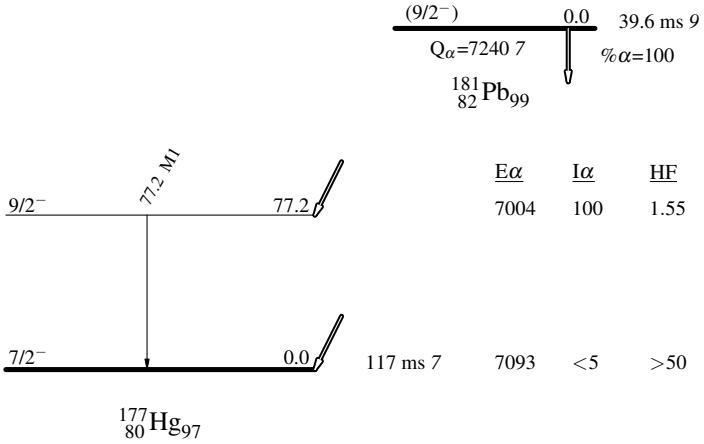
† From 2009An20.
‡ Using r_0(^{177}Hg)=1.52 *3*, weighted average of r_0=1.53 4 in ^{176}Hg (N=96) and 1.51 4 in ^{178}Hg (N=98), deduced from HF=1.
# Absolute intensity per 100 decays.

γ(^{177}Hg)

Eγ	E$_i$(level)	J_i^π	E$_f$	J_f^π	Mult.	Comments
77.2 *5*	77.2	9/2$^-$	0.0	7/2$^-$	M1	Eγ: From 2009An20. Mult.: From α(exp)=2.7 *9* using the intensity of 6990-7060 α group and 77.2γ in 2009An20.

^{181}Pb α decay 2009An20,2005CaZV

Decay Scheme



		Eα	Iα	HF
77.2		7004	100	1.55
0.0	117 ms 7	7093	<5	>50