^{197}Po α decay (25.8 s)

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 143, 1 (2017)	31-Mar-2017

Parent: ^{197}Po: E=230 *SY*; J^π=(13/2$^+$); $T_{1/2}$=25.8 s *1*; Q(α)=6412 *3*; %α decay=84 *9*

^{197}Po-E: From 2017Au03 (systematics value: 230 keV *80*). 204 keV *sy* in ^{197}Po Adopted Levels (2005Hu03). An average value of E(ex)≈201 keV can be obtained using systematic values in 2017Au03 for ^{195}Po(E≈90 keV) and ^{199}Po(E=312 keV).

^{197}Po-$T_{1/2}$: From 1993Wa04. Other values: 29 s *9* (1967Le21), 26 s *2* (1967Si09), 27 s *3* (1971Ho01), 40 s *10* (1982Bo04), and 32 s *2* (1996Ta18).

2002Va13: ^{162}Dy(^{40}Ar,5n) E(lab)=189 MeV. Magnetic mass separator for recoiling fragments. Implantation in position-sensitive Si strip detector. Reaction product identification by coincidences between recoil fragments and links in the α-ray decay chain. Determine α-γ and α-x-ray coincidences.

1982Bo04: sources from spallation of uranium, thorium, gold, and tantalum by 5-GeV protons, helium-jet transport; measured Eα (silicon surface-barrier detectors).

1981Sc01: sources from decay of ^{201}Rn parent; measured evaporation-residue α spectra (E and gas ΔE detectors), yields and angular distributions of fusion products. Deduced %α.

1971Ho01: sources from decay of ^{201}Rn parent, mass separation; measured Eα, Iα (silicon surface-barrier detectors, multispectrum analysis).

1967Si09: sources from ^{185,187}Re(^{19}F,xn), ^{194}Pt(^{12}C,xn), helium-jet transport; measured Eα, Iα (solid-state detectors).

1967Tr06: sources from decay of ^{197}At parent, helium-jet transport; measured Eα, Iα (silicon surface-barrier detectors).

Other: 1967Le21.

^{193}Pb Levels

E(level)	J^π	$T_{1/2}$	Comments
0+x	(13/2$^+$)	5.8 min *2*	E(level): Level energy 130 keV *80* in 2017Au03 from systematics. J^π,$T_{1/2}$: From Adopted Levels.
757+x	(13/2$^+$)		E(level): Based on two pairs of 5622α and 757 keV *1* γ-ray coincidences in ^{197}Po decay (2002Va13). J^π: Suggested in 2002Va13, based on the low hindrance factor for the 5622 keV α ray feeding this level from the 13/2$^+$ state in ^{197}Po.

α radiations

Eα	E(level)	Iα[‡]	HF[†]	Comments
5622 *25*	757+x	≥0.05	≤1.3	HF: In 2002Va13 ≤1.7 *10*. Eα,Iα: From 2002Va13. Intensity listed as ≥0.05 *3* because of the nonobservation of α-e$^-$ coincidences.
6383.4 *24*	0+x	99.3 *35*	1.2	Eα: from 1991Ry01 (based on recalibrated values of: 1982Bo04 (6385 *3*), 1971Ho01 (6380 *9*), 1967Si09 (6387 *8*), 1967Tr06 (6378 *5*)). Other value: 6385 keV *10* (2002Va13). Iα: from 2002Va13. HF: 2002Va13 gives a value of 2.0 *2*, no details for calculations are presented.

[†] r_0(^{193}Pb)=1.501 *5* From average of r_0(^{192}Pb)=1.506 *6* and r_0(^{194}Pb)=1.496 *3* (1998Ak04). For ^{193}Pb level energies, X=130 keV was considered (see 0+x level comment).

[‡] For absolute intensity per 100 decays, multiply by 0.84 *9*.

^{197}Po α decay (25.8 s) (continued)

$\gamma(^{193}Pb)$

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Comments
757 *1*	757+x	(13/2$^+$)	0+x	(13/2$^+$)	E_γ: From 2002Va13.

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Decay Scheme