^{180}Pb α decay 1999To11,1996To08

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 107, 791 (2006)	15-Sep-2005

Parent: ^{180}Pb: E=0.0; $J^\pi=0^+$; $T_{1/2}$=4.4 ms *11*; Q(α)=7415 *15*; %α decay=100.0
$T_{1/2}(^{180}Pb)$ from 1999To11.
1999To11: $^{90}Zr(^{92}Mo,2n)$, E=410 MeV; Detector: double sided Si strip detector; measured Eα, $T_{1/2}$; deduced α-branching ratio.
1996To08: $^{144}Sm(^{40}Ca,4n)$,E=230 MeV; detector: an array of six Si detector; measured Eα, Iα; deduced evidence for ^{180}Pb.

α/β branchings have not been experimentally determined. The gross-β calculations of 1973Ta30 yield $T_{1/2}(\beta^+)$=1-4 s from which β branching can be calculated as 0.1-0.4%. Any β branching is taken as negligible here and %α=100 is adopted.
Additional information 1.
Added-in-Proof: 1997Mo25 calculated the β partial half-life as $T_{1/2}(\beta)$=618.8 ms which corresponds to a β branching of 0.65%.

^{176}Hg Levels

E(level)	J^π
0.0	0^+

α radiations

Eα	E(level)	HF[†]	Comments
7250 *15*	0.0	1.0	Eα: From 1999To11. Other value: 7230 *40* (1996To08). Only one α group could be observed; due to the small production cross section and short half-life. Even the main α group was very weak in the spectrum. Therefore, any α less than half of the main α could not have been seen; besides, any α's to excited states would be obscured in the spectrum of 1996To08 by strong α's from other nuclei. Iα: the first 2^+ state in ^{176}Hg is at 613 keV. By requiring the hindrance factor to be >1 for an α transition to this level, its intensity should be Iα<1%. The calculated r_0 parameter retains the same value for Iα(7250)>96%. The computed r_0 parameter of 1.53 *4* is consistent with the expected value of 1.52 *2* from the r_0 systematics.

[†] $r_0(^{176}Hg)$=1.53 *4* (1998Ak04).