

^{196}Bi α decay: high spin 1991Va04

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 113, 1871 (2012)	15-Jun-2012

Parent: ^{196}Bi : E=271 5; $J^\pi=(10^-)$; $T_{1/2}=4.00$ min 5; $Q(\alpha)=5438$ 40; $\% \alpha$ decay= 3.8×10^{-4} 10

^{196}Bi - $\% \alpha$ decay: From 1991Va04, $\% \alpha(^{196}\text{Bi}, 10^-)=3.8 \times 10^{-4}$ 10.

Additional information 1.

1991Va04: mass separated sources (LISOL facility) from $\text{Re}(^{16}\text{O}, \text{xn})$ (E<180 MeV), $^{181}\text{Ta}(^{20}\text{Ne}, \text{xn})$ (E<240 MeV) and $^{182}\text{W}(^{20}\text{Ne}, \text{xn})$ (E<240 MeV); measured singles spectra for α , x, γ ; HP Ge (FWHM=2 keV at 1332) and low energy Ge (FWHM=0.58 keV at 122 keV) detectors, PIPS-type α detectors (FWHM=11-17 keV at 5486 keV); measured $E\alpha$, $I\alpha$, $T_{1/2}$, and parent $T_{1/2}$ and $\% \alpha$.

Calculations using Coulomb and proximity potential model: $T_{1/2}$, and HF for α decay from (10^-) ^{196}Bi (2011Sa10).

 ^{192}Tl Levels

E(level)	J^π [†]	$T_{1/2}$ [†]	Comments
138 45	(7 ⁺)	10.8 min 2	$\% \varepsilon + \% \beta^+ = 100$ E(level), $T_{1/2}$, J^π : from Adopted Levels.
388 45	(8 ⁻)	296 ns 5	$\% \text{IT} = 100$ E(level): from E(491 level)-E(83 γ). $T_{1/2}$: from Adopted Levels.
408 40	(9 ⁻)		
491 40	(10 ⁻)		E(level): from E(5112 α) and $Q(\alpha)$, assuming E=271 5 for the (10^-) isomer in ^{196}Bi . J^π : from 1991Va04; based on low HF for α decay from (10^-) ^{196}Bi .

[†] From Adopted Levels, except as noted.

 α radiations

$E\alpha$	E(level)	$I\alpha$ [‡]	HF [†]
5112 5	491	100	3.1 14

[†] If $r_0=1.468$ 21, unweighted average of $r_0(^{192}\text{Pb})=1.513$ 3 (this evaluation), $r_0(^{192}\text{Hg})=1.43$ 3 (extrapolated from r_0 in 1998Ak04 for lower-mass even-A Hg isotopes), and $r_0(^{190}\text{Hg})=1.432$ 23 and $r_0(^{194}\text{Pb})=1.496$ 3 (1998Ak04).

[‡] For absolute intensity per 100 decays, multiply by 3.8×10^{-6} 10.

 $\gamma(^{192}\text{Tl})$

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α [‡]	Comments
(20 20)	408	(9 ⁻)	388	(8 ⁻)			transition not observed; $E_\gamma \leq 40$ keV proposed by 1991Va04, consistent with its non-observance.
83 [†]	491	(10 ⁻)	408	(9 ⁻)	(M1)	2.71	Mult.: from Adopted Levels.
250.6 [†]	388	(8 ⁻)	138	(7 ⁺)	(E1)	0.0439	Mult.: from Adopted Levels.

[†] From level scheme In fig. 2 of 1991Va04. Value May have been taken from the literature; the γ spectrum is not presented by 1991Va04.

[‡] 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.

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Legend

Decay Scheme

-----> γ Decay (Uncertain)

