^{232}Pu α decay

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Khalifeh Abusaleem	NDS 116, 163 (2014)	31-Dec-2012

Parent: ^{232}Pu: E=0.0; $J^\pi=0^+$; $T_{1/2}$=33.1 min 8; Q(α)=6716 10; %α decay=23 6

$T_{1/2}$ measured in 2000La25 using α-α coincidence data. The source was produced in the reaction ^{233}U(^{3}He,4n)^{232}Pu Others: $T_{1/2}$(^{232}Pu)=34.1 min 7 (1973Ja06), 36 min 2 (1952Or03).

From x-ray and α counts, the ε/α branching ratio was deduced by 1952Or03 as <60 (this ratio yields %α>1.6) and an approximate upper limit of 20% was estimated by 1973Ja06. The α branching of 20% was adopted by 1991Sc08. This branch, together with Iα(6600α)=62 per 100 α decays, gives r$_0$=1.508.

The r$_0$ systematics suggests r$_0$(^{228}U)=1.518 10 for the nuclear radius parameter from which the α branch of ^{232}Pu is calculated as 23% 6 by requiring HF(6600α)=1.0, if Iα(6600α)=67% 5 of α decays. By considering the consistencies between the experimental observations and the α systematics, %α=23 6 is recommended here.

The gross-β calculations by 1973Ta30 predict $T_{1/2}(\varepsilon)$=5000 s which yields %ε=40.9.

The partial half-life of ^{232}Pu β^+ decay has been calculated by 1997Mo25 as >100 s.

^{228}U Levels

E(level)	J^π
0.0[†]	0^+
59[†] 14	2^+

[†] Band(A): K=0 g.s. band.

α radiations

Eα[†]	E(level)	Iα[‡][@]	HF[#]
6542 10	59	33 5	1.1 4
6600 10	0.0	67 5	1.000

[†] Measured by 1973Ja06.

[‡] α intensity per 100 α decays. The intensities given here are calculated by requiring that HF(6542α)=1.1 4, obtained from local systematics of hindrance factors of α's to the first 2^+ states. The authors of 1973Ja06 estimated Iα(6600α to g.s.)$\approx$62 from extrapolation of g.s. α intensities from other Pu isotopes; this intensity gives HF(2^+ state)$\approx$0.9, in agreement with the value obtained from HF systematics.

[#] r$_0$(^{228}U)=1.518 10 for %α=23 6 and Iα(6600α)=67 5%.

[@] For absolute intensity per 100 decays, multiply by 0.23 6.

^{232}Pu α decay

Band(A): K=0 g.s. band

2$^+$ **59**

0$^+$ **0.0**

$^{228}_{92}U_{136}$