

^{157}Lu α decay

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 170, 1 (2020)	16-Aug-2020

Parent: ^{157}Lu : $E=20.920$; $J^\pi=(11/2^-)$; $T_{1/2}=4.79$ s 12; $Q(\alpha)=5107.929$; $\% \alpha$ decay=6.2

^{157}Lu - $\% \alpha$ decay: α -decay intensity determined from ratio of $I_\alpha(\text{daughter})$ to $I_\alpha(\text{parent})$ (1979Ho10).

$T_{1/2}$ data are from 1979Ho10 (or 1981HoZM), 1979Be52, and 1992Ha10; $\% \alpha$ from 1970Ho10, and $E\alpha$ from these references and 1977Ha48, 1979Al16, 1983To01, and 1996Pa01. This decay is from an isomeric level.

1972GaZR: produced by $^{127}\text{I}(\text{Ar},10n)$ with $E(\text{Ar})=200$ to 300 MeV.

1977Ha48: produced by spallation of Ta target with 600 MeV p followed by isotope separation. Measured α 's with Si(Au) detector.

1979Al16: produced by spallation of W or Ta target with 1 GeV p followed by isotope separation. Measured α 's with Si(Au) detector. Also lab report 1979AlZM.

1979Be52: produced by spallation of Ta target with 1 GeV p and followed by isotope separation. Measured α 's with Si detector.

Also conference abstract 1979BeYR.

1979Ho10: produced by $^{107}\text{Ag}(^{58}\text{Ni},xn)$ and products separated in velocity selector. Measured α 's with Si detector. Also conference report 1981HoZM.

1983To01: produced by $^{144}\text{Sm}(^{19}\text{F},6n)$. Measured α 's with Si detector.

1992Ha10: produced by $\text{Ca}(^{127}\text{I},x)$ with $E(^{127}\text{I})=711$ MeV.

1996Pa01: produced by heavy-ion fusion-evaporation reaction with products separated in recoil mass spectrometer. Measured α 's with Si strip detector.

 ^{153}Tm Levels

E(level)	J^π
0.0	(11/2 ⁻)

 α radiations

$E\alpha$	E(level)	I_α^\ddagger	HF [†]	Comments
4996.4	0.0	100	2.8 10	$E\alpha$: Weighted average of 4980.20 (1977Ha48), 4995.10 (1979Al16), 4996.5 (1979Ho10), 4999.5 (1983To01), 4995.6 (1992Ha10), and 4997.4 (1996Pa01) with adopted uncertainty increased from 2.3 to 4 keV to allow for common uncertainties among the different measurements. Others: 5111 (1972GrZR) and 4995 (1979Be52). I_α : Value assumes that all of the α decay is via this branch.

[†] The nuclear radius parameter $r_0(^{153}\text{Tm})=1.579$ 11 is deduced from interpolation (or unweighted average) of radius parameters of the adjacent even-even nuclides.

[‡] For absolute intensity per 100 decays, multiply by 0.062.