^{256}Lr α decay 1971Es01,1976BeZY

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	A. M. Mattera, S. Zhu, A. B. Hayes, E. A. Mccutchan	NDS 172, 543 (2021)	1-Jan-2021

Parent: ^{256}Lr: E=0.0; $T_{1/2}$=27.9 s *10*; Q(α)=8810 *SY*; %α decay=90 *10*

^{256}Lr-$T_{1/2}$: from 2017Si08, from weighted average of 28 s *1* (2014Sa21), 25.9 s *17* (1976BeZY), 31 s *3* (1971Es01), 35 s *10* (1970Dr08), and 45 s *10* (1965Do10).

^{256}Lr-%α decay: only estimates of the the α decay/ε decay ratio have been made. The %ε has been estimated as ≈30% (1968Fl08) and ≤20% (1971Es01), but the similarity of the 8.42-MeV α group (1968Fl08) to the 8.43-MeV α of ^{256}Lr was not considered, so both should be regarded as upper limits. The authors of 1976BeZY state that ^{256}Lr decays by electron capture but did not measure the branching.

1971Es01: ^{256}Lr produced by ^{249}Cf(^{11}B,4n) at 59 and 71 MeV. Measured Eα, Iα, α(t) using five Si-Au surface barrier detectors after implantation in rotating wheel system.

1976BeZY: ^{256}Lr produced by ^{249}Cf(^{11}B,4n) reaction. Measured Eα, Iα, α(t), determined half-life.

^{252}Md Levels

E(level)[†]
≈49
≈158
≈204
≈246
≈287
≈359

[†] Energies of excited levels are calculated from the α energies measured in ^{256}Lr decay and Q(α)(^{256}Lr)≈8810, obtained by 2017Wa10 from Q(α) systematics.

α radiations

Eα[†]	E(level)	Iα[‡@]	HF[#]	Comments
8319 *15*	≈359	6.3 *15*	≈19	Eα=8.32 MeV *2* and Iα=8 *2* were measured by 1971Es01.
8390 *15*	≈287	18.8 *22*	≈11	Eα=8.39 MeV *2* and Iα=23 *5* were measured by 1971Es01.
8430 *15*	≈246	38.3 *29*	≈7	Eα=8.43 MeV *2* and Iα=34 *4* were measured in 1971Es01. Eα=8423 keV *20* measured by 2002Ho11.
8472 *15*	≈204	13.3 *15*	≈28	Eα=8.48 MeV *2*, Iα=13 *3* were measured 1971Es01. Eα=8465 keV *20* measured by 2002Ho11.
8517 *15*	≈158	19.1 *15*	≈27	Eα=8.52 MeV *2*, Iα=19 *3* were measured by 1971Es01.
8624 *25*	≈49	4.2 *11*	≈267	Eα=8.64 MeV *2* and Iα=3 *2* were measured by 1971Es01. Eα=8613 keV measured by 2004Fo08.

[†] From 1976BeZY. Eα values of 1971Es01 are quoted for comparison. Other values are also given in the comments. The α energies measured by 1971Es01 and 1976BeZY are in good agreement. For calibration, Eα(^{213}Fr)=6773, Eα(^{211}Po)=7443, Eα(^{253}Es)=6640 were used by 1971Es01; and Eα(^{244}Cm)=5804.9, Eα(^{243}Am)=5274.8, Eα(^{249}Cf)=5813.5 were used by 1976BeZY (see 1977Be36). The respective α energies of 6775.0 *17*, 7450.3 *5*, 6632.51 *5*, 5804.77 *5*, 5275.3 *10* and 5812.8 *16* are recommended by 1991Ry01.

[‡] α intensity per 100 α decays. Iα values of 1976BeZY are given here because the measurements are of higher precision than those of 1971Es01 (see comments in table), while the two sets of values agree within quoted errors.

[#] r_0(^{252}Md)=1.466 *15* is used in calculations.

[@] For absolute intensity per 100 decays, multiply by 0.90 *10*.