^{249}No α decay 2022Te01,2022Lo03

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja	NDS 189,1 (2023)	14-Feb-2023

Parent: ^{249}No: E=0.0; J^π=(5/2$^+$); $T_{1/2}$=38.1 ms *28*; Q(α)=9170 *syst*; %α decay<100

^{249}No-J^π: From 2022Te01 based on systematics of N=147 isotones (^{239}U, ^{241}Pu, ^{243}Cm); results from Geant simulations and the detected α from ^{249}No α decay (2022Te01). Note: Currently as of of date 14 February 2023, J^π=(7/2$^+$) for g.s. ^{249}No on the online version of ENSDF).

^{249}No-$T_{1/2}$: From time distribution measurement in 2022Te01 Note $T_{1/2}$= 38.3 ms *28* from τ=55 ms *4* given in 2022Te01 should be 38.1 ms *28*. See also same group (2021Sv02) with $T_{1/2}$=38.1 ms *25*. Others: 15 ms *+74−7* (2021Kh07).

^{249}No-%α decay: From Adopted Levels in ^{245}Fm.

2022Te01(superseeds 2021Te08, 2021Sv02): ^{245}Fm was produced from the α decay of ^{249}No. ^{249}No was synthesized in the fusion-evaporation reaction ^{204}Pb(^{48}Ca,3n) which was followed by separation in the separator for heavy element spectroscopy (SHELS) and identified with the GABRIELA detector array. GABRIELA array consists of a DSSD detector (FWHM=15-20 keV for α particle with Eα=6-10 MeV). TOF upstream from the DSSD distinguishes implanted recoils from their subsequent α, electron and SF decays. Particles escaping from the DSSD are then detected in 8 DSSDs with 16 strips forming a tunnel configuration. Measured Eα, recoil-$\alpha\alpha$(t).

2022Lo03: ^{245}Fm produced as the granddaughter from α decay of ^{253}Rf. ^{253}Rf was produced in fusion evaporation ^{204}Pb(^{50}Ti,n) with E(^{50}Ti)=244 MeV from the U400 Cyclotron at the Flerov Laboratory of Nuclear Reactions in Dubna Evaporation residues separated with the separator for heavy element spectroscopy (SHELS) were implanted into 10 double-sided silicon strip detectors (DSSD) for position and time correlation in the GABRIELA detector array. Particles escaping from the DSSD were then detected in 8 DSSDs with 16 strips forming a tunnel configuration. Measured Eα, recoil-$\alpha\alpha$(t) and fission properties of ^{253}Rf.

2020Kh10: ^{245}Fm produced via ^{208}Pb(^{40}Ar,3n) reaction. The ^{40}Ar beam was from the UNILAC linear accelerator at GSI with E(^{40}Ar)=192 MeV. The evaporation residues were separated from the primary beam by the velocity filter SHIP and were then implanted into a position sensitive 16-strip Si detector surrounded by six additional Si detectors and an HPGe Clover detector. Measured Eα, recoil-α recoil-$\alpha\alpha$, recoil-α(t), recoil-$\alpha\gamma$.

2015Re01: ^{245}Fm produced via ^{208}Pb(^{40}Ar,3n) reaction. ^{245}Fm was separated using the Separator for Heavy Element Spectroscopy (SHELS) at the U-400 accelerator at FLNR, JINR in Dubna, Russia. α activity of 8127.6 keV *10* was observed.

2007Ha29: ^{245}Fm produced via ^{208}Pb(^{40}Ar,3n) reaction. ^{245}Fm was separated using the using the gas-filled recoil ion separator GARIS at the RIKEN Linear Accelerator. α activity of 8.15 MeV was observed.

1998Sa08: ^{245}Fm was produced via ^{232}Th(^{20}Ne,7n) and ^{232}Th(^{22}Ne,9n) reactions. It was then separated by the electrostatic recoil separator VASSILISSA at JINR. The observed 8.16 MeV activity was probably from two main contributors ^{247m}Fm (8.18 MeV) and ^{245}Fm (8.15 MeV).

1967Nu01: ^{245}Fm produced via ^{233}U(^{16}O,4n), ^{239}Pu(^{12}C,6n) reactions. Targets were about 500 μg/cm^2 thick. α activity of 8.15 MeV was observed. Measured $T_{1/2}$ and excitation functions.

^{245}Fm Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	(1/2$^+$)	5.6 s *7*	Configuration=1/2$^+$[631]. $T_{1/2}$: From Adopted Level.
10† *calc*	(3/2$^+$)		Additional information 1.
40† *calc*	(5/2$^+$)		Additional information 2. Configuration=5/2$^+$[622].

† Deduced by 2022Te01 based on the broad alpha spectrum supported by Geant4 simulations.

^{249}No α decay 2022Te01,2022Lo03 (continued)

α radiations

Eα	E(level)	Comments
9105 *33*	40	Eα: Weighted average of 9129 keV *22* (2022Te01) and 9060 keV *30* (2021Kh07).

γ(^{245}Fm)

E_γ	E_i(level)	J_i^π	E_f	J_f^π
(10† *1*)	10	(3/2$^+$)	0.0	(1/2$^+$)
(30† *1*)	40	(5/2$^+$)	10	(3/2$^+$)

† Deduced by 2022Te01 based on the detected alphas and GEANT simulated spectrum. Assumed to be a M1 transition which would not be observed as it is highly converted.

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Decay Scheme

Legend

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