

²⁵¹No α decay (0.80 s) 2006He27,2004He28

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja	NDS 125, 395 (2015)	31-Mar-2014

Parent: ²⁵¹No: E=0.0; J ^{π} =(7/2⁺); T_{1/2}=0.80 s I; Q(α)=8752 I6; % α decay=84 I6

²⁵¹No-J ^{π} ,T_{1/2}: From Adopted Levels in ²⁵¹No (2013Br09).

²⁵¹No-Q(α): From 2012Wa38. Others: 8751 I6 from E α =8612 I6 (2006He27).

²⁵¹No-T_{1/2}: From 2006He27. Others: 0.78 s +38-22, 0.78 s 2 (2004He28), 0.76 s 3 (2001He35), 0.8 s 2 (1967Gh01).

²⁵¹No-Proposed configuration=7/2[624] (2006He27,2004He28).

²⁵¹No-% α decay: % α =91 +9-22, %SF<0.3, % ϵ is expected to be small % α is from total number of ²⁵⁵Rf α decays and the number of α - α correlations in α decay chain: ²⁵⁵Rf-²⁵¹No-²⁴⁷Fm (2001He35).

2009Fo02: ²⁵¹No produced in the α decay of ²⁵⁵Rf, which is the daughter from the α decay of ²⁵⁹Sg. ²⁵⁹Sg was produced in the ²⁰⁸Pb(⁵²Cr,n) reaction at the Lawrence Berkeley National Laboratory with ⁵²Cr beam energy ranging between E=250-267 MeV. Decay products were observed using a detector array consisting of 48 vertically position-sensitive detector strips. Measured α spectra and half-live from six ²⁴⁷Fm decays resulting from α decays of ²⁵¹No to ²⁴⁷Fm.

2006He27: ²⁵¹No produced by the ²⁰⁶Pb(⁴⁸Ca,3n) reaction at E=4.80 MeV/nucleon ⁴⁸Ca beam at UNILAC accelerator at GSI, and from α decay of ²⁵⁵Rf. Reaction products were separated from the primary beam by the SHIP velocity filter and implanted into a position-sensitive 16-strip PIPS detector.

Measured E γ , I γ , $\gamma\gamma$, α - γ coin, ce, and lifetimes with a clover detector.

2004He28: ²⁵¹No was produced via ²⁰⁶Pb(⁴⁸Ca,3n) reaction at E_{lab}=230.5 MeV ⁴⁸Ca beam at UNILAC accelerator at GSI.

Reaction products were separated from the primary beam by the SHIP velocity filter and implanted into a position-sensitive 16-strip PIPS detector for α measurement.

Measured E γ , I γ , $\gamma\gamma$, α - γ coin, ce, and lifetimes with a clover detector.

2001He35: ²⁵¹No was produced via ²⁵⁵Rf α decay at the filter SHIP at GSI. HPGe detectors were used to measure α - γ coin, ce half-life.

1989He03: ²⁵¹No was produced via α decay chain of ²⁵⁵104 at GSI. Measured α and T_{1/2} with surface barrier detectors.

1967Gh01: ²⁵¹No was produced via ²⁴⁴Cm(¹²C,5n) at Berkeley heavy-ion linear accelerator. α spectra and T_{1/2} were measured.

All data are from 2006He27, unless otherwise stated.

²⁴⁷Fm Levels

E(level)	J ^{π}	T _{1/2}	Comments
0.0	(7/2 ⁺)	31 s I	% α =64 (2006He27); % ϵ +% β^+ =36 T _{1/2} : From 2006He27. Others: 57 s +30-17 (2009Fo02), 29 s I (2004He28), 37 s +21-10 (1989He03), 35 s 4 (1967FL15). Proposed configuration=7/2[624] (2006He27,2004He28).
45 7	(1/2 ⁺)	5.1 s 2	%IT=12 2 (2006He27); % α =88 2 T _{1/2} : From 2006He27. Other: 4.3 s 4 (2004He28). E(level): From 2006He27 based on the mean value derived from the α energy in the α K x-ray measurement and the difference in measured Q(α) values for decays from g.s. to g.s and g.s to isomeric states. Other: \approx 29 keV (2004He28). Proposed configuration=1/2[631] (2006He27,2004He28).

α radiations

E α^{\ddagger}	E(level)	I α^{\ddagger} &	HF@	Comments
8524 [#] 17		\approx 0.5	\approx 133	E α : Statistical uncertainty=8.
8552 [#] 17		\approx 1	\approx 66	E α : Statistical uncertainty=8.
8571 [#] 17		\approx 0.5	\approx 133	E α : Statistical uncertainty=7.
8562 17	45	\approx 0.3	\approx 161	E α : Statistical uncertainty=7. E α =8578 I0 (2001He35).
8612 16	0.0	\approx 98	\approx 0.68	E α : Statistical uncertainty=4. E α =8608 5 (2004He28), 8621 I0 (2001He35).

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${}^{251}\text{No}$ α decay (0.80 s) [2006He27,2004He28](#) (continued)

α radiations (continued)

- † Disagreements between the relative intensities of two alpha groups observed by [1967Gh01](#), [1989He03](#) and [2001He35](#) were explained by [2004He28](#) by existence of two separate α decaying ${}^{251}\text{No}$ parent states which were produced in different amounts in direct reactions than in α decay of ${}^{255}\text{Rf}$. Alpha's assigned to these two parent states were followed by different alpha activities.
- ‡ Three types of uncertainties are combined in quadrature: statistical uncertainty of 4-8 keV; systematic uncertainty of 15 keV from calibration methods/standards; uncertainty of 3 keV due to reproducibility of an α peak energy.
- # Tentative line in the α spectrum. Possibly contributed by summing of main α -line with conversion electrons from highly-converted transition(s).
- @ $r_0({}^{247}\text{Fm})=1.4708\ 58$, unweighted average of $r_0({}^{246}\text{Fm})=1.465\ 7$ and $r_0({}^{248}\text{Fm})=1.4765\ 19$ [1998Ak04](#) is used in calculations for hindrance factors.
- & For absolute intensity per 100 decays, multiply by 0.84 16.