^{257}No α decay 2005As05

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 114,1041 (2013)	1-Mar-2012

Parent: ^{257}No: E=0.0; J^π=(3/2$^+$); $T_{1/2}$=24.5 s *5*; Q(α)=8466 *21*; %α decay=85 *15*

^{257}No-$T_{1/2}$: From 2005As05; others: 25 s *3* (2000La34), 25 s *1* (1970Es02), 23 s *2* (1967Gh01), 24 s *3* (2011Ha13), 22 s *+14−6* (2011Ha13).

^{257}No-J^π: Configuration=3/2[622].

^{257}No-%α decay: based on 2002Ho11 estimate ε+$β^+$=1%−30% from experimental results.

^{257}No produced in ^{248}Cm(^{13}C,4n) reaction, E=70 MeV for αγ coin and E=76, 69 MeV for α-ce coin, on-line mass separator and gas-jet transport system. Measured Eγ, Iγ, α, αγ, ce, α(ce), (ce)(ce) coin, ^{257}No isotopic half-life. Earlier results: 2000HaZO.

Others: Eα: 2003Tu05, 2000La34, 1970Es02, 1967Gh01, and Iα: 1970Es02, 1967Gh01.

^{253}Fm Levels

E(level)[†]	J^π	Comments
0[‡]	1/2$^+$	
22.30[‡] *15*	(3/2$^+$)	
47.10[‡] *23*	(5/2$^+$)	
124.10[#] *10*	3/2$^+$	J^π: favored α decay from 3/2[622] state, same configuration assigned to 124 level in ^{253}Fm. The band assignment is tentative.
158.70[#] *25*	(5/2$^+$)	The band assignment is tentative.

[†] Deduced by the evaluator using a least-squares fit to the γ ray energies.
[‡] Band(A): 1/2$^+$[620] band.
[#] Band(B): 3/2$^+$[622] band.

α radiations

E=8270 alpha branch observed by 1970Es02 and 1967Gh01 is not observed by 2005As05.

Eα	E(level)	Iα[‡]	HF[†]
8187[#]	158.70	<4	>25
8222 *6*	124.10	83 *2*	1.9 *4*
8323 *7*	22.30	17 *2*	20 *5*

[†] r_0(^{253}Fm)=1.4779 *11*.
[‡] For absolute intensity per 100 decays, multiply by 0.85 *15*.
[#] Existence of this branch is questionable.

γ(^{253}Fm)

Iγ normalization: ΣI(γ+ce)(γ's from 124 level)=Iα(8222α)=83.

E_γ	E_i(level)	J_i^π	E_f	J_f^π
22.3[‡&]	22.30	(3/2$^+$)	0	1/2$^+$
24.8[‡&]	47.10	(5/2$^+$)	22.30	(3/2$^+$)
47.1[‡&]	47.10	(5/2$^+$)	0	1/2$^+$

Continued on next page (footnotes at end of table)

^{257}No α decay 2005As05 (continued)

$\gamma(^{253}Fm)$ (continued)

E_γ	I_γ[@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[†]	Comments
77.0 *2*	100 *8*	124.10	$3/2^+$	47.10	$(5/2^+)$	M1	22.4	α(L1)exp+α(L2)exp=10 *3* α(L)=16.8 *3*; α(M)=4.15 *7*; α(N+..)=1.528 *25* α(N)=1.159 *19*; α(O)=0.306 *5*; α(P)=0.0595 *10*; α(Q)=0.00335 *6*
101.8 *1*	57 *13*	124.10	$3/2^+$	22.30	$(3/2^+)$	(M1)[#]	9.97	α(L1)exp+α(L2)exp<8.3 α(L)=7.45 *11*; α(M)=1.84 *3*; α(N+..)=0.678 *10* α(N)=0.514 *8*; α(O)=0.1360 *20*; α(P)=0.0264 *4*; α(Q)=0.001484 *22*
124.1 *1*	78 *28*	124.10	$3/2^+$	0	$1/2^+$	M1	5.63	α(L1)exp+α(L2)exp=5.4 *26* α(L)=4.20 *6*; α(M)=1.039 *15*; α(N+..)=0.383 *6* α(N)=0.290 *5*; α(O)=0.0767 *11*; α(P)=0.01488 *22*; α(Q)=0.000836 *12* Mult.: M1 or E2 from α(L1)exp+α(L2)exp, but ce(L3) indicates dominantly M1, with δ(E2/M1)=0.87 *20*.
136.4 *2*	18 *11*	158.70	$(5/2^+)$	22.30	$(3/2^+)$	(M1)[#]	4.29	α(L1)exp+α(L2)exp<3.8 α(L)=3.20 *5*; α(M)=0.792 *12*; α(N+..)=0.292 *5* α(N)=0.221 *4*; α(O)=0.0584 *9*; α(P)=0.01134 *17*; α(Q)=0.000636 *10*

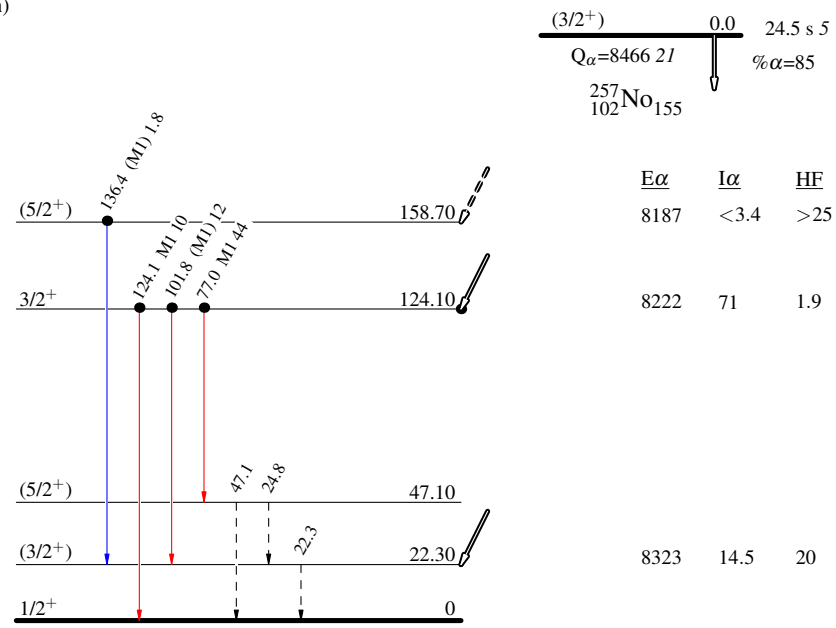
† Additional information 1.
‡ Low-energy electrons associated with this transition observed in coin with 8323α and with 50 keV electrons in (ce)(ce) coin.
# M1 or E1 from α(L1)exp+α(L2)exp plot shown in figure 5 of 2005As05, assigned parities suggest M1 (evaluators′ note).
@ For absolute intensity per 100 decays, multiply by 0.019 *4*.
& Placement of transition in the level scheme is uncertain.

^{257}No α decay 2005As05

Decay Scheme

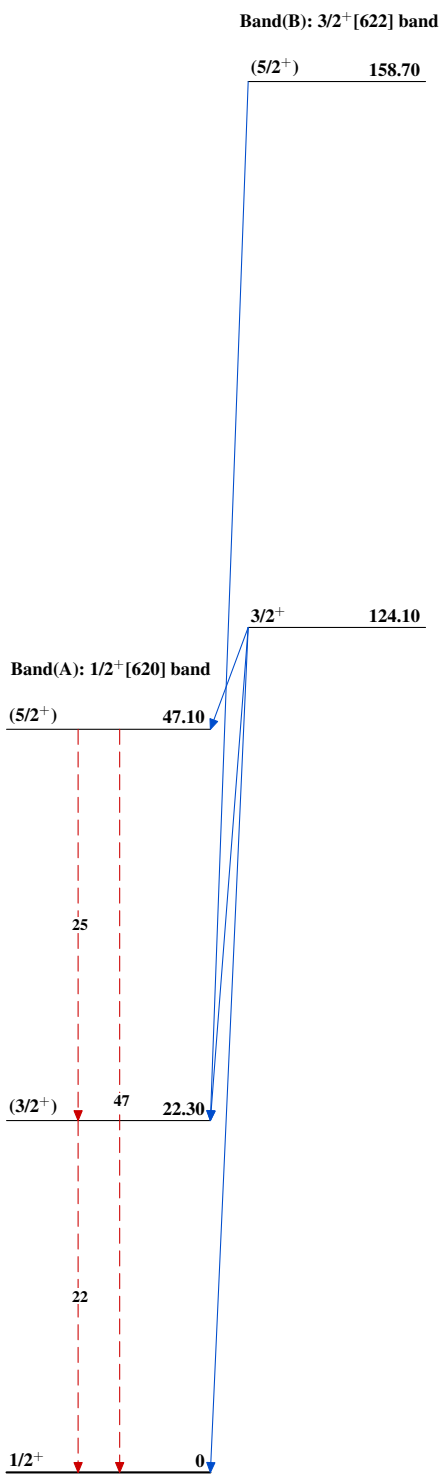
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)
- Coincidence



Eα	Iα	HF
8187	<3.4	>25
8222	71	1.9
8323	14.5	20

^{257}No α decay 2005As05



$^{253}_{100}Fm_{153}$