^{255}Md α decay 1970Fi12,2000Ah02,2005He27

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. Morse	NDS 189,111 (2023)	23-Sep-2022

Parent: ^{255}Md: E=0; J^{π}=(7/2$^-$); $T_{1/2}$=27 min *2*; Q(α)=7905.6 *17*; %α decay=7 *1*

^{255}Md-$T_{1/2}$: From 1970Fi12.

^{255}Md-Q(α): From 2021Wa16.

^{255}Md-%α decay: From 1970Fi12.

2000Ah02 only places the 7326-keV α in the level scheme. The remaining α decays have been placed by the evaluator based on the similarity of the level energies deduced from the α-decay energies to the level energies determined in the ε-decay and (α,t) datasets.

2005He27: ^{255}Md produced as grand-daughter of ^{255}Lr (ε decay) produced in reaction: ^{209}Bi(^{48}Ca,2n) E=4.55-4.65 MeV/nucleon; and as daughter of ^{255}No produced in reaction: ^{208}Pb(^{48}Ca,4n) E=4.45 MeV/nucleon. ^{255}Lr decays by ε to ^{255}No which further decays by ε decay to ^{255}Md. Evaporation residues were separated from the primary beam by velocity SHIP at GSI facility. Measured (fragments)α coin, $\alpha\gamma$ coin, prompt and delayed γ rays, K-x rays. A Clover detector used for γ rays.

^{251}Es Levels

E(level)[†]	J^{π}[†]	Comments
0	3/2$^-$	configuration=π3/2$^-$[521]
8.34[‡] *23*	(7/2)$^+$	configuration=π7/2$^+$[633]
31.70 *20*	5/2$^-$	
55.85[‡] *23*	(9/2)$^+$	
76.1 *3*	7/2$^-$	
461.40[#] *22*	7/2$^-$	configuration=π7/2$^-$[514]
513?[#] *6*	(9/2$^-$)	E(level): From ΔE_{α} assuming that the 7274-keV α-decay populates the 9/2$^-$ member of the 7/2$^-$[514] band. This is rather different than E(level)=523 *2* keV from 250Cf(α,t), and should be regarded as tentative. Not included in Adopted Levels.

† From Adopted Levels, except for 513-keV level.

‡ Band(A): π7/2$^+$[633] band.

Band(B): π7/2$^-$[514] band.

α radiations

Eα[†]	E(level)	Iα[†#]	HF[‡]	Comments
7274 *5*	513?	5.0 *5*	25 *5*	
7326 *4*	461.40	93 *3*	2.1 *4*	Eα: Weighted average of 7327 *4* keV (2000Ah02) and 7313 *15* keV (2005He27).
7714 *8*	76.1	1.0 *2*	5.6×10^3 *15*	
7752 *8*	31.70	1.0 *2*	7.7×10^3 *20*	

† From 2000Ah02, unless otherwise noted.

‡ The nuclear radius parameter r_0(^{251}Es)=1.4825 *14* is deduced from interpolation (or unweighted average) of radius parameters of the adjacent even-even nuclides (2020Si16).

For absolute intensity per 100 decays, multiply by 0.07 *1*.

^{255}Md α decay 1970Fi12,2000Ah02,2005He27 (continued)

γ(^{251}Es)

E_γ	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Comments
405.35 *21*	75 *5*	461.40	7/2−	55.85	(9/2)+	E_γ: Weighted average of 405.5 *3* keV (2000Ah02) and 405.2 *3* keV (2005He27). I_γ: Weighted average of 72.7 *72* (normalized to the intensity of the 453-keV transition in 2000Ah02) and 76 *8* (2005He27).
452.90 *21*	100	461.40	7/2−	8.34	(7/2)+	E_γ: Weighted average of 453.0 *3* keV (2000Ah02) and 452.8 *3* keV (2005He27).

† For absolute intensity per 100 decays, multiply by 0.07 *1*.

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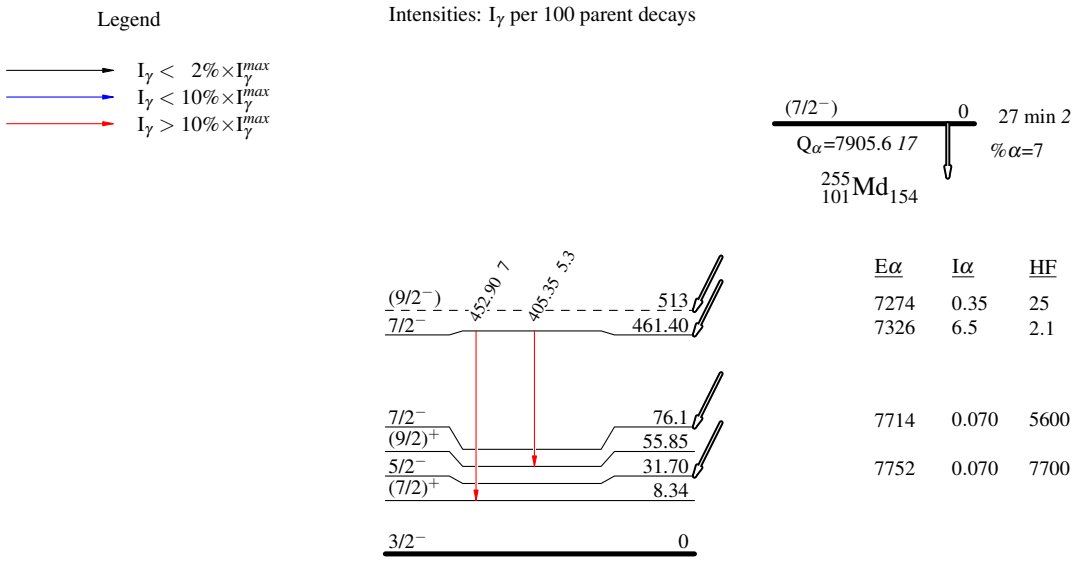
Decay Scheme

Intensities: I_γ per 100 parent decays



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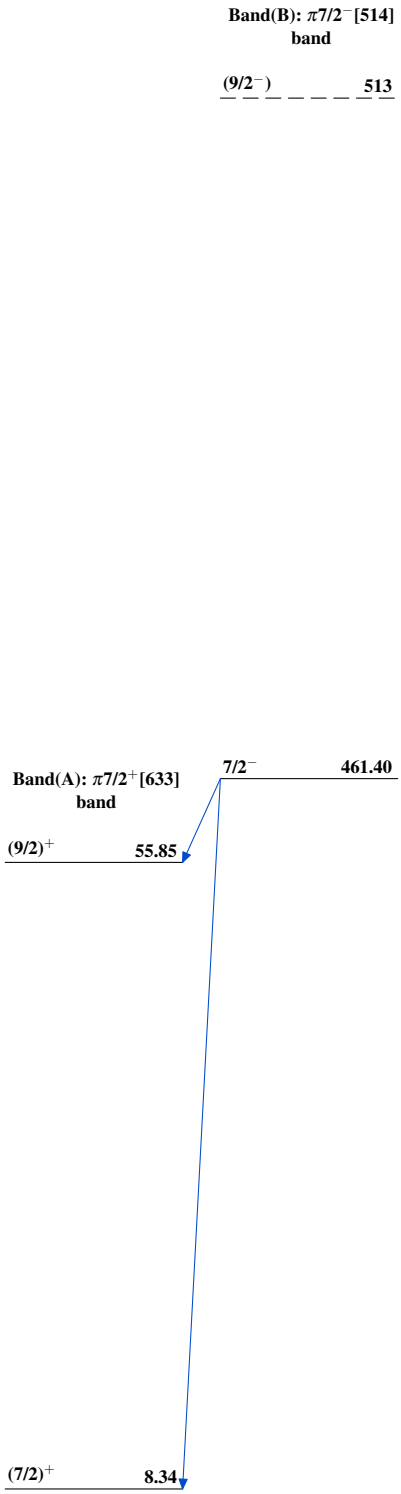

$^{251}_{99}Es_{152}$