Adopted Levels, Gammas

History

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

Q(β^-)=−334 *3*; S(n)=6352 *50*; S(p)=4310 *5*; Q(α)=6739.16 *5* 2012Wa38

Calculations, compilations:
α decay: 1996St28, 1993Bu09, 1992Bu03.
g.s. properties: 1997Mo25, 1995Mo29, 2004Pa40.
Pion decay: 1988Io05.
Single-particle Nilsson levels: 1994Cw02, 2004Pa40.

1994Cw02 calculated the following predominant configurations: g.s., 7/2[633]; 0.29 MeV, 3/2[521]; 0.32 MeV, 1/2[521]; 0.58 MeV, 7/2[514]; 0.62 MeV, 1/2[660]; 0.71 MeV, 5/2[642].
2004Pa40 have calculated following predominant configurations: 0.16 MeV, 1/2[521]; 0.22 MeV, 3/2[521]; 0.48 MeV, 1/2[400]; 0.50 MeV, 7/2[514]; 0.51 MeV, 5/2[642].

2008Gu05 (same as 2007Se08) measured $T_{1/2}$ vs temp with isotope implanted in metallic iron and found no temperature dependance of its half-life.

^{253}Es Levels

Cross Reference (XREF) Flags

A ^{253}Cf β^- decay
B ^{253}Fm ε decay
C ^{257}Md α decay

E(level)†	J$^\pi$&	$T_{1/2}$	XREF	Comments
0‡	7/2$^+$	20.47 d *3*	ABC	%α=100; %SF=8.7×10^{-6} *3* (2003Au03) μ=4.10 *7* (2011StZZ,1975Go05); Q=6.7 *8* (2011StZZ,1975Go05) J$^\pi$: 7/2 from optical spectroscopy (1970Wo14), π=+ from configuration=(π 7/2[633]) from μ (1972El21). $T_{1/2}$: from 20.467 d *24* (1969DrZZ); others: 20.50 d *17* (1987Po22), 20.31 d *16* (1982Po13), 20.7 d *3* (1966Rg01), 20.03 d *1* (1956Jo09). %SF: from %α/%SF=1.15×10^7 *3* (1965Me02), resulting in $T_{1/2}$(SF)=6.4×10^5 y *2*. 2000Ho27 have recommended SF half-life as 6.3×10^5 y *2* from weighted average of values given by 1954Fi14, 1956Jo09 and 1965Me02. Other SF half-life calculations: 2005Re16, 2004Ro01.
46.3‡ *3*	(9/2$^+$)		A C	
80‡ *8*	(11/2$^+$)		C	
106 *4*			C	J$^\pi$: This level has been observed in the alpha decay of ^{257}Md and assigned the Nilsson state 3/2-3/2[521] (1993Mo18). However, there is no evidence of being populated from ^{253}Fm (1/2+1/2[620]) as it would be expected. A 106-keV M2 γ-ray transition to the ground state (7/2+7/2[633]) in ^{253}Es has not been observed (1967Ah02).
139# *3*	(5/2$^-$)		C	
181.3# *5*	(7/2$^-$)		C	
371.4@ *1*	(7/2$^-$)		C	J$^\pi$: γ's to 7/2$^+$ g.s. and (9/2$^+$) level indicate J$^\pi$ 5/2$^+$,7/2,9/2$^+$. From Nilsson model the most likely single-particle configuration=(π 7/2[514]).
435@ *2*	(9/2$^-$)		C	J$^\pi$: band assignment; favored α decay from ^{257}Md.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{253}Es Levels (continued)

† From ^{257}Md α decay, unless otherwise noted.
‡ Band(A): Band 7/2$^+$[633]. A=5.16 keV *2* (if β=0), E$_0$=−81.3 keV *3*.
# Band(B): Band 3/2$^-$[521]. A=6.6 keV *10* (if β=0), E$_0$=81 keV *6*.
@ Band(C): Band 7/2$^-$[514]. A=7.11 keV *22* (if β=0), E$_0$=259 keV *3*.
& From band assignment, unless specifically stated.

$\gamma(^{253}Es)$

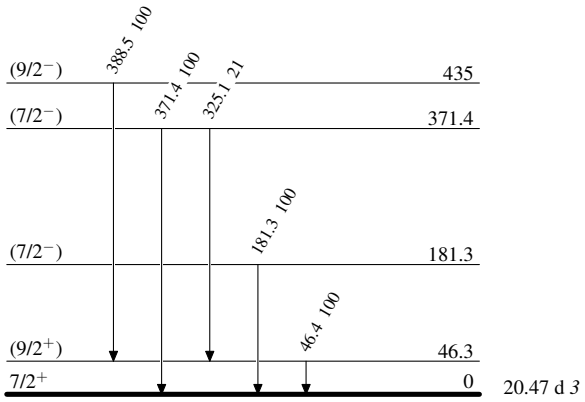
All γ data are from ^{257}Md α decay, unless otherwise noted.

E$_i$(level)	J$_i^\pi$	E$_\gamma$	I$_\gamma$	E$_f$	J$_f^\pi$	Comments
46.3	(9/2$^+$)	46.4 *1*	100	0	7/2$^+$	E$_\gamma$: from ^{253}Cf β^- decay.
181.3	(7/2$^-$)	181.3 *5*	100	0	7/2$^+$	
371.4	(7/2$^-$)	325.1 *2*	21 *3*	46.3	(9/2$^+$)	
		371.4 *1*	100 *5*	0	7/2$^+$	
435	(9/2$^-$)	388.5 *15*	100	46.3	(9/2$^+$)	

Adopted Levels, Gammas

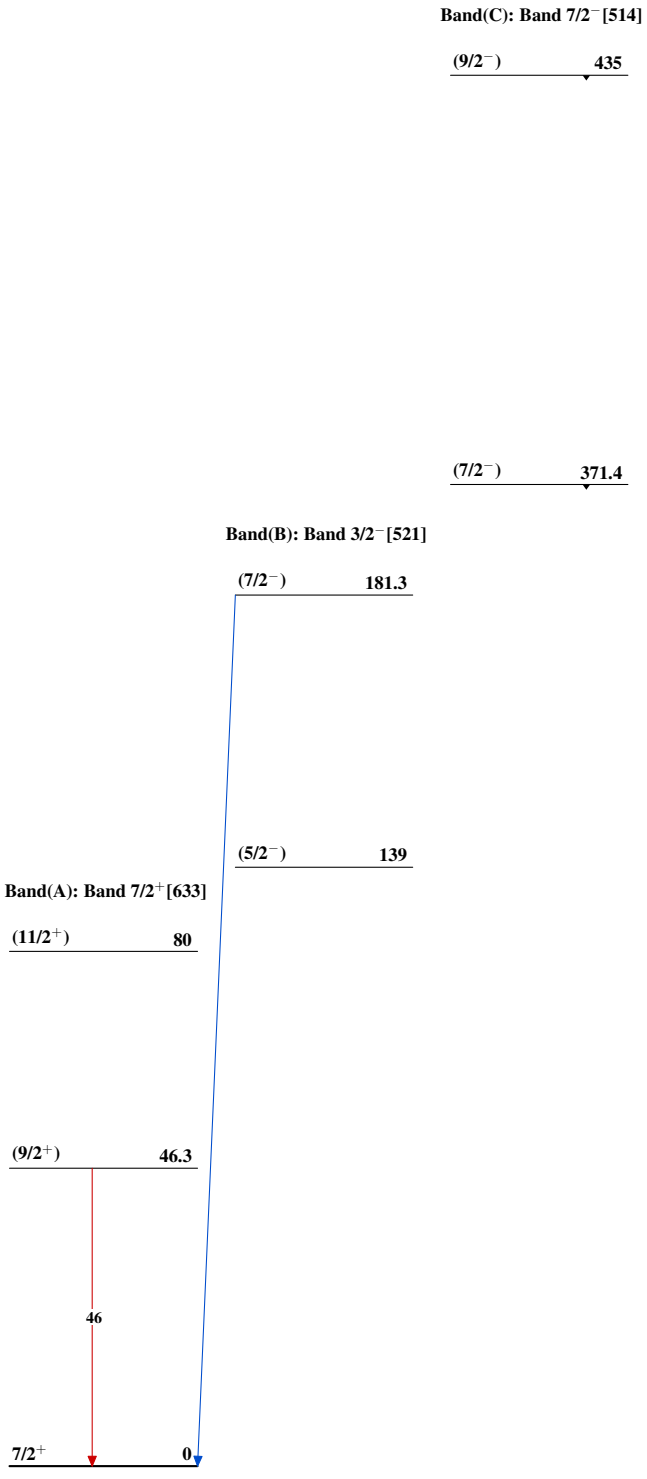
Level Scheme

Intensities: Relative photon branching from each level



$^{253}_{99}Es_{154}$

Adopted Levels, Gammas



$^{253}_{99}Es_{154}$