^{92}Mo(^{54}Fe,n5pγ), (^{52}Cr,n3pγ) 1991Fi03,2006Ta08

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 154,1 (2018)	20-Nov-2018

1991Fi03: 97% enriched ^{92}Mo(HI,xpyn), HI= 312 MeV ^{54}Fe and 244 MeV ^{52}Cr at LBL SuperHILAC with OASIS mass separator and tape transport. Detector array: Si ΔE-E, HPGe, 2 n-type Ge, 1-mm plastic scintillator Measured γ, $\gamma\gamma$, K x ray; I(K x ray)=50 *5* relative to 174.6γ.

2006Ta08: 98.7% enriched 1 mg/cm^2 ^{92}Mo(^{54}Fe,n5p) reaction at 315 MeV at Oak Ridge HRIBF. The recoil products were separated in mass/charge ratio by recoil-mass separator (RMS). Measured Eγ, Iγ, $\gamma\gamma$, conversion electrons using two segmented Ge Clover detectors for γ rays and Si(Li) conversion electron spectrometer (BESCA).

Level scheme from 2006Ta08.

^{140}Eu Levels

E(level)	J$^\pi$ [†]	T$_{1/2}$	Comments
0.0	1$^+$	1.51 s *2*	%ε+%β^+=100 T$_{1/2}$,%ε+%β^+: From Adopted Levels. Configuration=πd$_{5/2}\otimes\nu$d$_{3/2}$.
174.6 *9*	2$^+$		
185.3 *9*	3$^+$		
0+x	5$^-$	125 ms *2*	%IT=100; %ε+%β^+<1 (1991Fi03) Additional information 1. E(level): x=210 *25* (≈50 keV above the 185.3 level). J$^\pi$: Deduced by 1991Fi03 from transition strength (RUL) arguments; confirmed by 2006Ta08 from ^{142}Tb isotone. T$_{1/2}$: from 1991Fi03. Configuration=πh$_{11/2}\otimes\nu$s$_{1/2}$, πh$_{11/2}\otimes\nu$d$_{3/2}$.
170.47+x *21*	6$^-$		
284.83+x *21*	6$^-$		
361.39+x *22*	7$^-$		
389.27+x *23*	(7$^-$)		
422.43+x *19*	7$^-$		
459.5+x *3*	8$^+$	302 ns *4*	%IT=100 Configuration=πh$_{11/2}\otimes\nu$h$_{11/2}$. T$_{1/2}$: from γ(t) (2006Ta08).

[†] From 2006Ta08 (based on mult).

γ(^{140}Eu)

E$_\gamma$ [†]	I$_\gamma$ [†‡]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	α[a]	I$_{(\gamma+ce)}$ [#]	Comments
(10.7[@])		185.3	3$^+$	174.6	2$^+$				γ deduced by 1991Fi03 based on estimated B(E3)↓ of transition feeding the 174.6 level that substantially exceeds 1 W.u., contrary to expectations based on systematics of E3; this indicates that most of the observed intensity of 174.6γ is due to a 10.7-keV, M1 transition (not observed).
33.0 *10*	6 *3*	422.43+x	7$^-$	389.27+x	(7$^-$)	(M1)	7.3 *7*	24 *12*	
37.1 *3*	100 *9*	459.5+x	8$^+$	422.43+x	7$^-$	E1	0.737 *20*	84 *8*	α(exp)=0.65 *28*
<49[@&b]		0+x	5$^-$						
<59[@&b]		0+x	5$^-$						
98.1 *3*	26 *3*	459.5+x	8$^+$	361.39+x	7$^-$	E1	0.299	16 *2*	α(K)exp=0.3 *1* α(K)=0.251 *4*

Continued on next page (footnotes at end of table)

^{92}Mo(^{54}Fe,n5pγ), (^{52}Cr,n3pγ) 1991Fi03,2006Ta08 (continued)

γ(^{140}Eu) (continued)

E_γ [†]	I_γ [†‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α [a]	$I_{(\gamma+ce)}$ [#]	Comments
104.5 *3*	9 *2*	389.27+x	(7^-)	284.83+x	6^-	(M1+E2)	1.85 *23*	13 *3*	1.6<α(exp)<2.1.
137.5 *3*	15 *3*	422.43+x	7^-	284.83+x	6^-	(M1+E2)	0.762 *20*	13 *3*	0.75<α(exp)<0.78.
170.4 *3*	53 *7*	170.47+x	6^-	0+x	5^-	M1+E2	0.390 *21*	37 *6*	α(K)exp=0.4 *1* α(K)=0.30 *5*
174.6[@]		174.6	2^+	0.0	1^+	M1	0.383		I_γ: 100 *4* (1991Fi03).
185.3[@]		185.3	3^+	0.0	1^+	E2	0.278		α(K)exp=0.19 *4* (1991Fi03) α(K)=0.193 *3* I_γ: 92 *4* (1991Fi03).
190.8 *3*	16 *4*	361.39+x	7^-	170.47+x	6^-	M1+E2	0.276 *24*	10 *2*	α(exp)=0.21 *7*
252.0 *3*	50 *7*	422.43+x	7^-	170.47+x	6^-	M1+E2	0.121 *20*	28 *4*	α(exp)=0.11 *5*
284.8 *3*	38 *6*	284.83+x	6^-	0+x	5^-	M1+E2	0.085 *17*	21 *3*	α(K)exp=0.08 *3* α(K)=0.069 *17*
361.5 *3*	14 *4*	361.39+x	7^-	0+x	5^-	E2	0.0332	7 *2*	
389.2 *3*	7 *3*	389.27+x	(7^-)	0+x	5^-	(E2)	0.0267	4 *2*	
422.5 *3*	59 *10*	422.43+x	7^-	0+x	5^-	E2	0.0212	30 *5*	

[†] From 2006Ta08 except where noted; Eγ's also measured or deduced by 1991Fi03 are noted separately.
[‡] Relative intensities.
[#] %I(γ+ce) from 2006Ta08.
[@] From 1991Fi03 and confirmed by 2006Ta08.
[&] Upper limit for Eγ established by 1991Fi03 from nonobservation of K x-ray intensity associated with isomeric decay.
[a] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[b] Placement of transition in the level scheme is uncertain.

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Level Scheme

Intensities: %I(γ+ce)

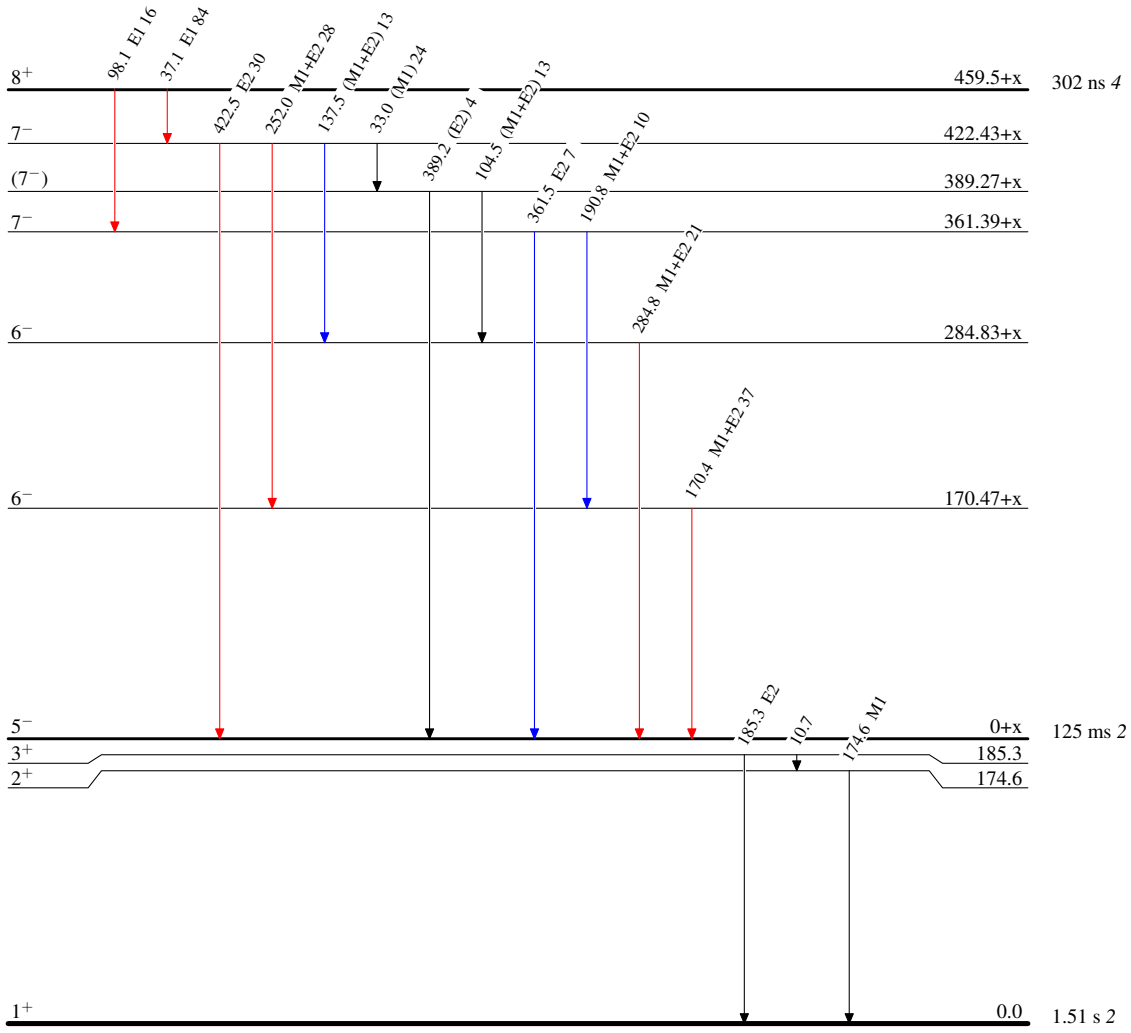
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



$^{140}_{63}Eu_{77}$