^{252}Cf SF decay 1998Hw02,2006Or05

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	D. De Frenne	NDS 110, 2081 (2009)	1-Mar-2009

Parent: ^{252}Cf: E=0.0; $J^\pi=0^+$; $T_{1/2}$=2.645 y *8*; %SF decay=3.092 *8*

1998Hw02: assignment: (fragment)(fragment)(K x ray)(γ)-coin and (fragment)(fragment)(γ)(γ)-coin. measured: Eγ, Iγ, $\gamma\gamma\gamma$. Deduced: ^{103}Mo levels, J^π, band structure.

2006Or05: Measured γ, g factors by time integrated perturbed angular correlation functions. The γ rays were detected with GAMMASPHERE array with 101 Compton-suppressed Ge detectors.

Others: 1991Ho16 (^{248}Cm SF decay), 1974ClZX, 1972ClZN, 1973TaZG.

^{103}Mo Levels

g-factors were inferred from Larmor precessions deduced from the measurement of time integrated perturbed angular correlation functions (2006Or05).

E(level)[†]	J^π[‡]	Comments
0.0[#]	(3/2$^+$)	
102.79[#] *19*	(5/2$^+$)	g=+0.057 *13* (2006Or05) g: from (139γ)(103γ)(θ) and (250γ)(103γ)(θ). g_K=−0.46 *11*, g_R=+0.23 *3*; assuming Q_t=3.84 *17*.
241.1[#] *3*	(7/2$^+$)	g=−0.03 *13* (2006Or05) g: from (193γ)(139γ)(θ) and (397γ)(139γ)(θ). g_K=−0.73 *17*, g_R=+0.09 *13*; assuming Q_t=3.7 *3*.
346.5[@] *4*	(5/2$^-$)	
353.88[@] *24*	(7/2$^-$)	g=−0.094 *31* (2006Or05) g: from (145γ)(250γ)(θ).
433.5[#] *4*	(9/2$^+$)	
478.6[@] *3*	(9/2$^-$)	
498.4[@] *3*	(11/2$^-$)	g<0 (2006Or05) g: from (362γ)(145γ)(θ).
637.9[#] *5*	(11/2$^+$)	
850.9[@] *4*	(13/2$^-$)	
861.5[@] *4*	(15/2$^-$)	
901.7[#] *5*	(13/2$^+$)	
1156.8[#] *6*	(15/2$^+$)	
1408.6[@] *5*	(19/2$^-$)	
1426.4[@] *4*	(17/2$^-$)	
2115.4[@] *6*	(23/2$^-$)	
2164.2[@] *6*	(21/2$^-$)	
2960.4[@] *8*	(27/2$^-$)	

[†] Calculated with a least-squares procedure based on observed γ energies.
[‡] From proposed band structure and systematics (1998Hw02).
[#] Band(A): ν3/2[411] (2006Or05).
[@] Band(B): ν5/2[532] (2006Or05).

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γ(^{103}Mo)

A_2 and A_4 are from 2006Or05.
ΔIγ: ΔIγ not given by 1998Hw02; estimated by the evaluator between 10 and 50% depending on Iγ.
ΔE: ΔEγ not given by 1998Hw02; estimated by the evaluator between 0.2 and 1.0 depending on Iγ. For γ's where no Iγ was given ΔEγ=0.5 was estimated.

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡&]	δ[‡]	α[a]	Comments
(7.5 *5*)		353.88	(7/2⁻)	346.5	(5/2⁻)				E_γ: not observed experimentally but required from the coincidence relationship.
(19.6 *5*)		498.4	(11/2⁻)	478.6	(9/2⁻)				E_γ: not observed experimentally but required from the coincidence relationship.
102.8 *2*	100	102.79	(5/2⁺)	0.0	(3/2⁺)	M1+E2	−0.28 *9*	0.30 *5*	$(g_K-g_R)/Q_0$=−0.15 *5*.
112.9 *3*	26 *5*	353.88	(7/2⁻)	241.1	(7/2⁺)				
124.9 *3*	22 *4*	478.6	(9/2⁻)	353.88	(7/2⁻)				
131.9 *5*	3.6 *18*	478.6	(9/2⁻)	346.5	(5/2⁻)				
138.5 *5*		241.1	(7/2⁺)	102.79	(5/2⁺)	M1+E2	−0.15 *3*	0.108 *4*	$(g_K-g_R)/Q_0$=−0.26 *5*. (139γ)(103γ)(θ): A_2=+0.275 *10*, A_4=−0.001 *15*.
144 *1*	100	498.4	(11/2⁻)	353.88	(7/2⁻)	(E2)		0.322 *10*	α(K)=0.270 *8*; α(L)=0.0430 *14*; α(M)=0.00766 *23*; α(N+..)=0.00112 *4* α(K)exp=0.3 *1* (1991Ho16) Mult.: from α(exp) (1991Ho16). (145γ)(250γ)(θ): A_2=−0.083 *11*, A_4=−0.017 *17*.
192.1 *5*		433.5	(9/2⁺)	241.1	(7/2⁺)				(192γ)(139γ)(θ): A_2=+0.411 *26*, A_4=−0.025 *37*.
204.5 *5*		637.9	(11/2⁺)	433.5	(9/2⁺)				
237.3 *3*	8.1 *24*	478.6	(9/2⁻)	241.1	(7/2⁺)				
241.1 *5*		241.1	(7/2⁺)	0.0	(3/2⁺)				
251.1 *2*	58 *6*	353.88	(7/2⁻)	102.79	(5/2⁺)				(251γ)(103γ)(θ): A_2=+0.089 *8*, A_4=−0.025 *12*.
255.0 *5*		1156.8	(15/2⁺)	901.7	(13/2⁺)				
264.0 *5*		901.7	(13/2⁺)	637.9	(11/2⁺)				
330.7 *5*		433.5	(9/2⁺)	102.79	(5/2⁺)				
346.5 *5*	3.0 *15*	346.5	(5/2⁻)	0.0	(3/2⁺)				
352.7 *3*	5.2 *25*	850.9	(13/2⁻)	498.4	(11/2⁻)				
363.0 *3*	43 *9*	861.5	(15/2⁻)	498.4	(11/2⁻)				(362γ)(145γ)(θ): A_2=+0.079 *7*, A_4=+0.008 *11*.
372.3 *3*	7.0 *21*	850.9	(13/2⁻)	478.6	(9/2⁻)				
397.0 *5*		637.9	(11/2⁺)	241.1	(7/2⁺)				(397γ)(139γ)(θ): A_2=−0.110 *12*, A_4=+0.025 *17*.
468.0 *5*		901.7	(13/2⁺)	433.5	(9/2⁺)				
519.0 *5*		1156.8	(15/2⁺)	637.9	(11/2⁺)				
547.0 *2*	17 *5*	1408.6	(19/2⁻)	861.5	(15/2⁻)				
564.5 *5*	2 *1*	1426.4	(17/2⁻)	861.5	(15/2⁻)				
575.7 *3*	7.5 *22*	1426.4	(17/2⁻)	850.9	(13/2⁻)				
706.8 *3*	6 *3*	2115.4	(23/2⁻)	1408.6	(19/2⁻)				
738.0 *5*	1.7 *9*	2164.2	(21/2⁻)	1426.4	(17/2⁻)				
755.5 *5*	1.3 *7*	2164.2	(21/2⁻)	1408.6	(19/2⁻)				
845.0 *5*	2.7 *5*	2960.4	(27/2⁻)	2115.4	(23/2⁻)				

[†] Taken from 1998Hw02. It supersedes the results of 1991Ho16 for ^{248}Cm SF decay.

Continued on next page (footnotes at end of table)

^{252}Cf SF decay 1998Hw02,2006Or05 (continued)

$\gamma(^{103}Mo)$ (continued)

‡ From 2006Or05, unless noted otherwise.
# $\Delta I\gamma$ not given by 1998Hw02; estimated by the evaluator between 10 and 50% depending on $I\gamma$.
@ $\Delta E\gamma$ not given by 1998Hw02; estimated by the evaluator between 0.2 and 1.0 depending on $I\gamma$. For γ's where no $I\gamma$ was given $\Delta E\gamma$=0.5 was estimated.
& Transitions in ΔJ=1 band are assumed M1 and in ΔJ=2 bands as E2.
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.

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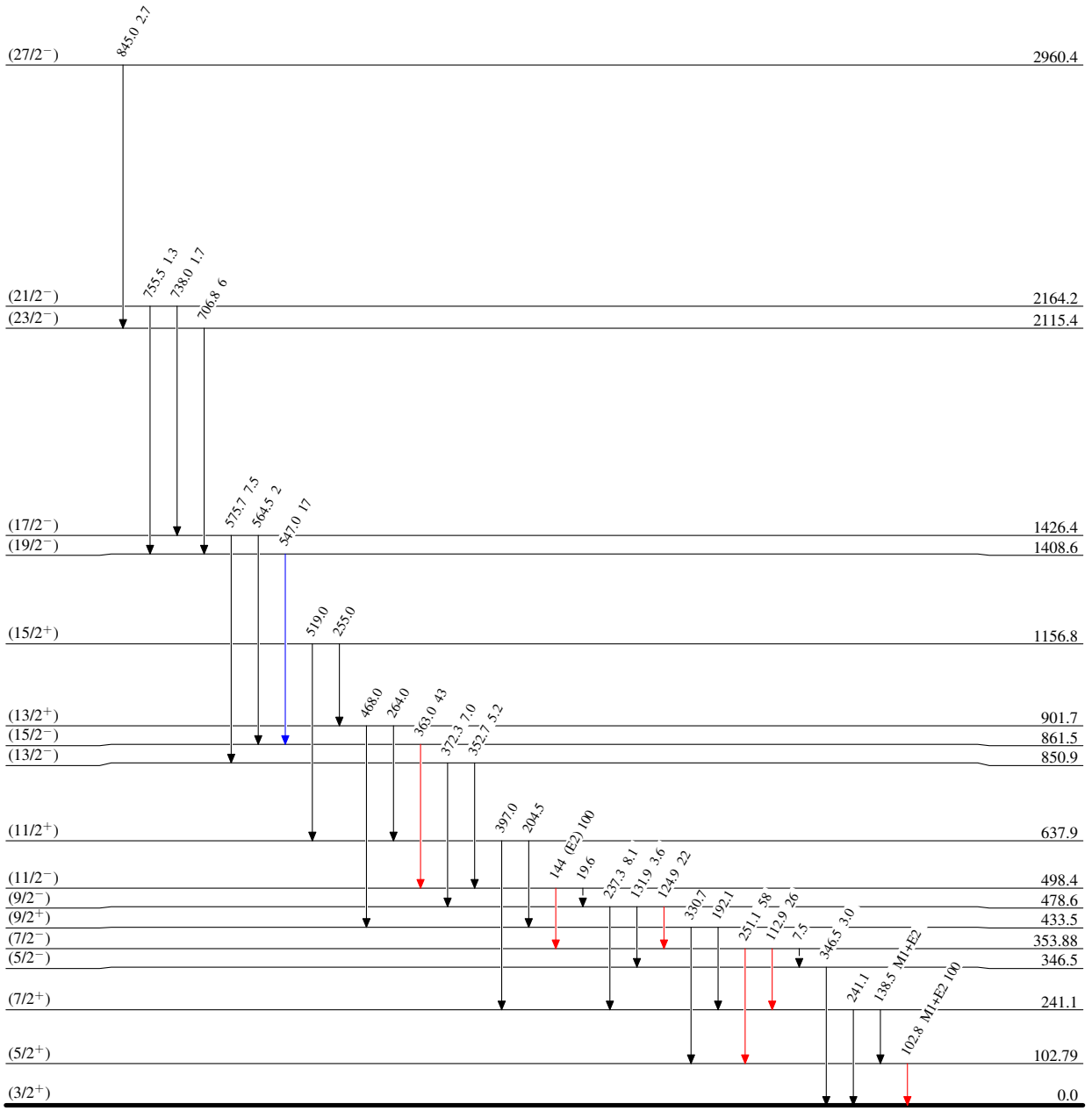
Level Scheme

Intensities: Type not specified

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)



$^{103}_{42}Mo_{61}$

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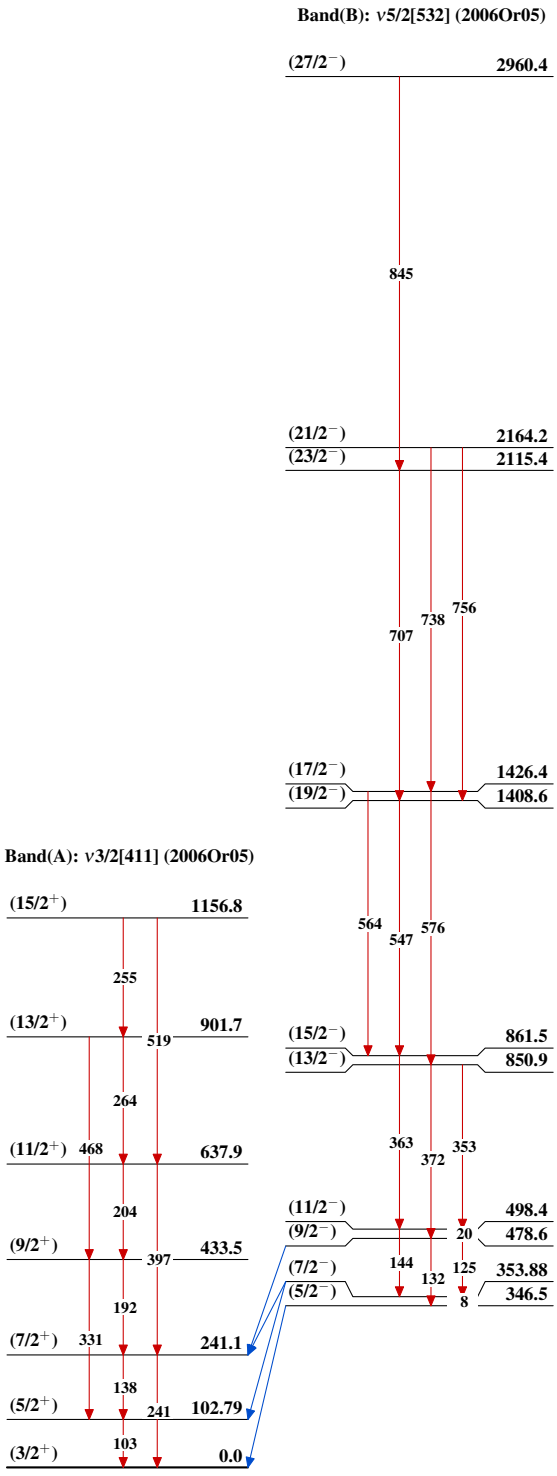

$^{103}_{42}Mo_{61}$