

<sup>252</sup>Cf SF decay 1998Hw04

Type	History		Literature Cutoff Date
	Author	Citation	
Full Evaluation	Jean Blachot	ENSDF	1-Jul-2008

Parent: <sup>252</sup>Cf: E=0.0; J<sup>π</sup>=0<sup>+</sup>; T<sub>1/2</sub>=2.645 y δ; %SF decay=?

Measured E<sub>γ</sub>, I<sub>γ</sub>, γγ using Gammasphere array of 72 Compton suppressed Ge detectors.

The isotopes identification is based on the known γ of the Cs nuclei which are the fission partners of Tc isotopes.

1970Jo20, 1970Wa05, 1972Ho08, 1973TaZG have measured gammas and proposed them as transitions in <sup>108</sup>Tc arising from prompt deexcitation of fission fragments from <sup>252</sup>Cf(SF).

Mass assignments for the transitions were deduced from measurements of the fission fragments in coincidence with the respective γ's (1970Jo20,1970Wa05,1973TaZG,1976ChZD). Nucleus assignment is based on measurement of the K x ray's emitted in coincidence with the γ's (1970Wa05,1972Ho08,1973TaZG,1976ChZD).

Only those γ's reported by more than one author are listed below. Only 1998HW04 has proposed level scheme, even though 1973TaZG measured γγ-coincidences.

The level scheme is as given by 1998Hw04.

<sup>108</sup>Tc Levels

E(level) <sup>†</sup>	E(level) <sup>†</sup>	E(level) <sup>†</sup>	E(level) <sup>†</sup>
0.0+x <sup>‡</sup>	330.6+x <sup>‡</sup> 13	734.0+x <sup>@</sup> 18	1676.3+x <sup>@</sup> 21
86.2+x 8	413.1+x <sup>#</sup> 16	773.1+x <sup>#</sup> 18	2058.9+x <sup>&amp;</sup> 22
106.2+x 8	454.0+x <sup>@</sup> 16	921.3+x <sup>&amp;</sup> 19	2359.0+x <sup>@</sup> 23
176.6+x <sup>‡</sup> 7	568.6+x <sup>#</sup> 18	1145.2+x <sup>@</sup> 19	
293.2+x <sup>#</sup> 13	579.7+x <sup>&amp;</sup> 18	1457.9+x <sup>&amp;</sup> 20	

<sup>†</sup> From least-squares fit E<sub>γ</sub>'s, assuming Δ(E<sub>γ</sub>)=0.3 keV.

<sup>‡</sup> Band(A): Band #1.

<sup>#</sup> Band(B): Band #2.

<sup>@</sup> Band(C): Band #3a.

<sup>&</sup> Band(c): Band #3b.

γ(<sup>108</sup>Tc)

E <sub>γ</sub> <sup>†</sup>	I <sub>γ</sub> <sup>†</sup>	E <sub>i</sub> (level)	E <sub>f</sub>	Comments
70.4		176.6+x	106.2+x	
86.2		86.2+x	0.0+x	E <sub>γ</sub> : E=86.5, T <sub>1/2</sub> =140 ns (1970Jo20), 117 ns (1973TaZG). 1973TaZG also observed a 10-ns component in this transition.
90.4		176.6+x	86.2+x	E <sub>γ</sub> : E=90.0, T <sub>1/2</sub> = 120 ns (1970Jo20), 116 ns (1973TaZG). E=90.2, T <sub>1/2</sub> = 15 ns (1970Jo20), 8 ns (1973TaZG).
106.2		106.2+x	0.0+x	E <sub>γ</sub> : E=106.1, T <sub>1/2</sub> =120 ns (1970Jo20), 128-ns and 14-ns components observed by 1973TaZG.
116.6		293.2+x	176.6+x	
119.9		413.1+x	293.2+x	E <sub>γ</sub> : E=119.8, T <sub>1/2</sub> =110 ns (1970Jo20), 126-ns and 7-ns components observed by 1973TaZG.
123.4	100	454.0+x	330.6+x	
125.7	100	579.7+x	454.0+x	
154.0	123.7	330.6+x	176.6+x	E <sub>γ</sub> : 1976ChZD measured perturbed angular correlation on a 153.9γ, deduced g= 0.50 4. No level scheme for <sup>108</sup> Tc was proposed at this time; therefore, it is not known to what level the measured g factor corresponds.
154.2	24.7	734.0+x	579.7+x	T <sub>1/2</sub> =110 ns (1970Jo20), 108 ns (1973TaZG), 110 ns 10 (1976ChZD).
155.5		568.6+x	413.1+x	

Continued on next page (footnotes at end of table)

$^{252}\text{Cf}$  SF decay **1998Hw04** (continued) $\gamma(^{108}\text{Tc})$  (continued)

$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_i(\text{level})$	$E_f$	Mult.	Comments
176.6		176.6+x	0.0+x	E2	Mult.: from $T_{1/2}$ . $E_\gamma$ : $E=176.3$ , $T_{1/2}=110$ ns ( <a href="#">1970Jo20</a> ), 114-ns and 8-ns components observed by <a href="#">1973TaZG</a> .
187.5	46.6	921.3+x	734.0+x		
204.5		773.1+x	568.6+x		
218.5	11.3	1676.3+x	1457.9+x		
224.1	29.9	1145.2+x	921.3+x		
<sup>x</sup> 249.4					$E_\gamma$ : also observed by <a href="#">1972Ho08</a> . $T_{1/2}=16$ ns ( <a href="#">1970Jo20</a> ), 11 ns ( <a href="#">1973TaZG</a> ).
280.0	15.3	734.0+x	454.0+x		
312.7	11.1	1457.9+x	1145.2+x		
341.6	16.2	921.3+x	579.7+x		
360.0		773.1+x	413.1+x		
410.9	19.2	1145.2+x	734.0+x		
531.0	10.2	1676.3+x	1145.2+x		
536.7	10.2	1457.9+x	921.3+x		
601.0	3.0	2058.9+x	1457.9+x		
682.7	2.5	2359.0+x	1676.3+x		

<sup>†</sup> From [1998Hw04](#), unless otherwise noted.

<sup>x</sup>  $\gamma$  ray not placed in level scheme.

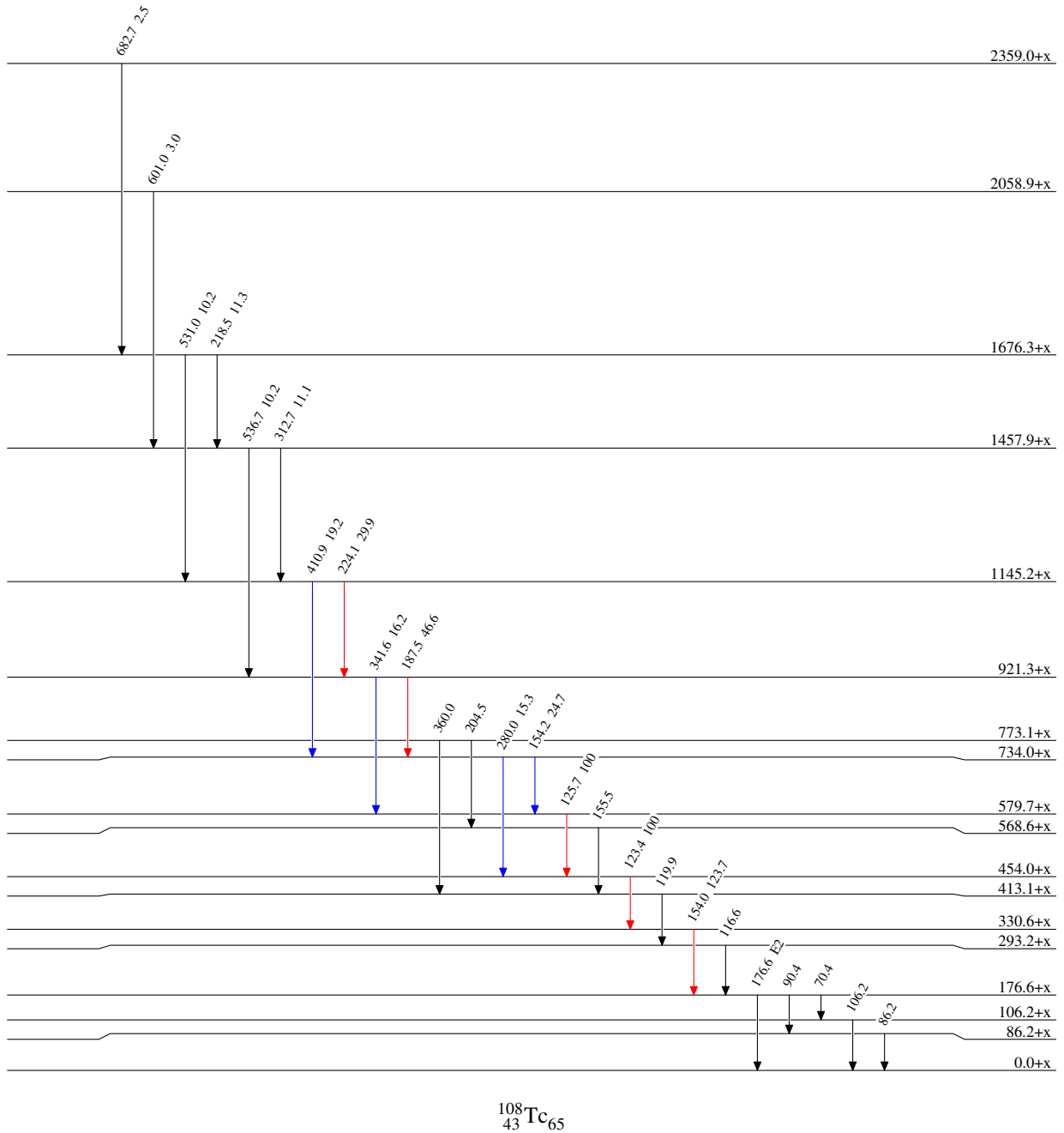
$^{252}\text{Cf}$  SF decay 1998Hw04

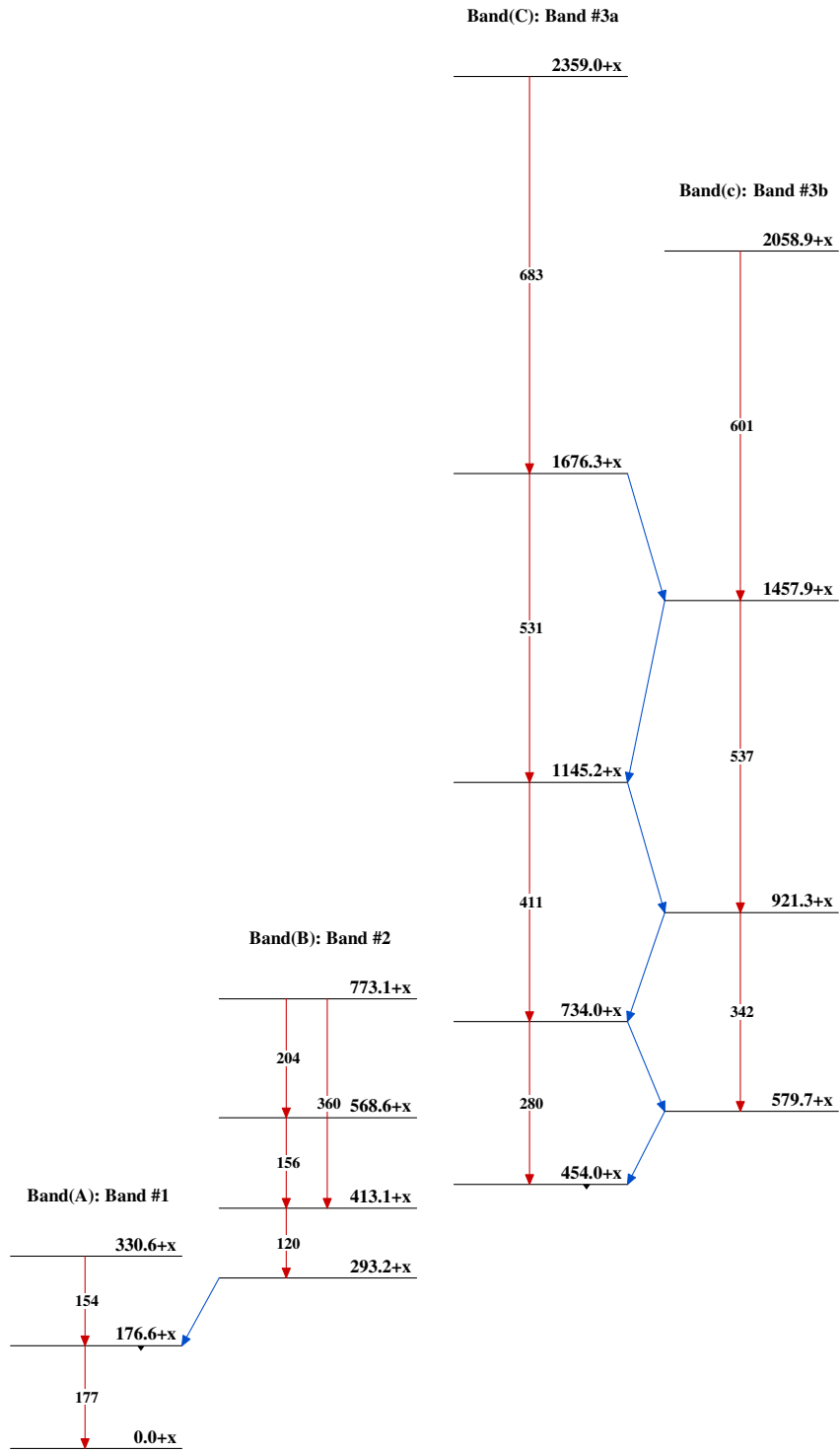
## Level Scheme

Intensities: Type not specified

## Legend

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$

 $^{108}_{43}\text{Tc}_{65}$

$^{252}\text{Cf}$  SF decay 1998Hw04 $^{108}_{43}\text{Tc}_{65}$