^{252}Cf SF decay 2009Hw03,1974ClZX

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 113, 2187 (2012)	15-Sep-2012

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

^{252}Cf-%SF decay: %SF(^{252}Cf)=3.092 *8* (from ENSDF database for ^{252}Cf).

2009Hw03: ^{252}Cf source (α-decay intensity of 62 μCi) placed between two 13-micron thick Fe foils inside a 7.62 cm polyethylene ball; Gammasphere array (101 Compton-suppressed Ge detectors); measured Eγ, Iγ, $\gamma\gamma\gamma$ coin, (Pm x ray)-γ-γ coin, Pm-Rb cross coincidences.

1974ClZX: ^{252}Cf source (2x10^5 fissions/sec) placed between cooled Si-Au surface barrier detectors; planar Si(Li) detector (FWHM=0.56 At 26 keV) for Eγ=10-100; prompt x-ray shield; planar Ge(Li) detector (FWHM=2.9 At 1332 keV); coax Ge(Li) detector (FWHM=3.8 At 1332); measured Eγ, fragment-fragment-γ(In Si(Li) and/or Ge(Li) detectors) delayed coincidences, γ-K x ray coin; $\gamma\gamma$ coin, isomer $T_{1/2}$.

The level scheme is based on the coincidence data from 2009Hw03.

^{92}Rb Levels

E(level)†	J^π‡	$T_{1/2}$	Comments
0.0	0^-		
142.5 *3*	1^-	0.75 ns *3*	$T_{1/2}$: from Adopted Levels.
284.9 *5*	3^-	≈57 ns	$T_{1/2}$: 1974ClZX report a $T_{1/2}$=57 ns 142γ from ^{92}Rb which is strongly coincident with itself and with K x ray(Rb); this implies the existence of an isomeric level in ^{92}Rb with E≥284 keV which is not populated in ^{92}Kr β^- decay (1974ClZX).
431.6 *5*			
1388.6 *6*			
1648.2 *5*			
1683.1 *6*			
1959.4 *7*			
2693.9 *7*			
2980.8 *8*			
3700.5 *8*			
4789.9 *9*			

† From least-squares fit to Eγ.

‡ From Adopted Levels.

γ(^{92}Rb)

Eγ†	Iγ‡	E$_i$(level)	J_i^π	E$_f$	J_f^π	Mult.	α#	Comments
(34.9)		1683.1		1648.2				Eγ: from level energy difference. existence of transition was indirectly confirmed in a coincidence spectrum double-gated on the 286.9γ and 734.5γ (authors report a 33 keV low-energy cutoff for their experiment).
142.4 *3*	70 *4*	284.9	3^-	142.5	1^-	E2	0.264 *5*	Eγ: 142.4-keV transition observed in coincidence spectra double-gated on the previously known 142.5-keV transition and another transition in ^{92}Rb. Iγ: I(142.4γ)/I(142.5γ)=0.70 assumed by 2009Hw03. Mult.: from Adopted Gammas.
142.5 *3*	100 *5*	142.5	1^-	0.0	0^-	M1	0.0553	α(K)=0.0488 *8*; α(L)=0.00547 *9*; α(M)=0.000904 *14*; α(N+..)=0.0001065 *17* α(N)=0.0001022 *16*; α(O)=4.35×10^{-6} *7* Mult.: from Adopted Gammas.
146.7 *3*	39 *2*	431.6		284.9	3^-			
276.3 *3*	20 *1*	1959.4		1683.1				

Continued on next page (footnotes at end of table)

^{252}Cf SF decay 2009Hw03,1974ClZX (continued)

$\gamma(^{92}Rb)$ (continued)

E_γ †	I_γ ‡	E_i(level)	E_f	E_γ †	I_γ ‡	E_i(level)	E_f	J^π_f
286.9 *3*	7 *1*	2980.8	2693.9	1089.4 *3*	1 *1*	4789.9	3700.5	
294.5 *3*	5 *1*	1683.1	1388.6	1216.6 *3*	4 *1*	1648.2	431.6	
719.7 *3*	5 *1*	3700.5	2980.8	1251.5 *3*	5 *1*	1683.1	431.6	
734.5 *3*	16 *2*	2693.9	1959.4	1363.3 *3*	22 *1*	1648.2	284.9	3^-
957.0 *3*	6 *1*	1388.6	431.6					

† From 2009Hw03. Uncertainty of 0.3 keV assigned as per e-mail reply to XUNDL database compilers from the first author on Sept 21, 2009. The statistical uncertainty according to that e-mail reply is 0.1 keV.

‡ From 2009Hw03. Uncertainty of 5% for Iγ>20, 15% for Iγ=2-20 and 30% for Iγ<2 assigned by evaluator based on statement in e-mail reply of Sept. 21, 2009 from the first author that the statistical uncertainty is 1% but the total uncertainty (including systematic) is 5% for strong lines and up to 30% for very weak ones. In the assignment of the uncertainty, the number of significant digits has been kept the same as in the partial level scheme in figure 5 of 2009Hw03.

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: Relative I_γ

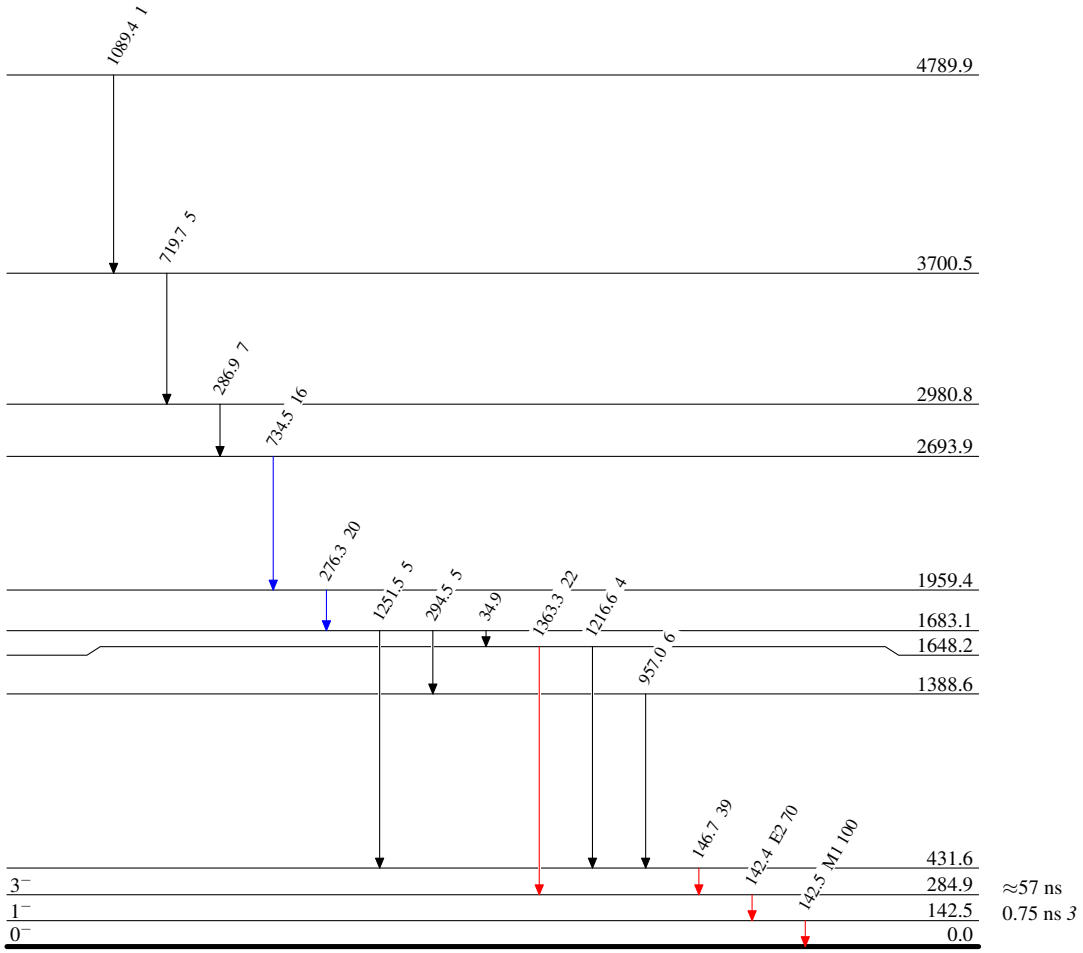
Legend

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

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

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

γ Decay (Uncertain)



$^{92}_{37}Rb_{55}$