^{248}Cm SF decay 2004Ur07

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 109, 1383 (2008)	1-Mar-2008

Parent: ^{248}Cm: E=0.0; $J^\pi=0^+$; $T_{1/2}=3.48\times10^5$ y *6*; %SF decay=?
Levels of ^{107}Tc were studied through the spontaneous fission of a ^{248}Cm source.
Measured Eγ, Iγ, γγ, γγ(θ) with the EUROGAM2 array.

^{107}Tc Levels

E(level)†	Jπ	E(level)†	Jπ	E(level)†	Jπ	E(level)†	Jπ
0.0	3/2⁻	275.2‡ *4*	9/2⁺	1142.8# *5*	15/2⁺	2055.8‡ *6*	21/2⁺
45.59@ *20*	5/2⁻	412.7@ *3*	9/2⁻	1228.0@ *5*	15/2⁻	2844.6‡ *7*	(25/2⁺)
65.60‡ *24*	5/2⁺	567.9# *4*	11/2⁺	1329.8‡ *5*	17/2⁺	3586.2‡ *7*	
134.40 *24*	5/2⁻	645.4@ *3*	11/2⁻	1595.7@ *5*	(17/2⁻)		
137.0# *4*	7/2⁺	727.5‡ *4*	13/2⁺	1839.3# *6*	(19/2⁺)		
206.81@ *20*	7/2⁻	934.1@ *4*	13/2⁻	1941.0@ *6*	(19/2⁻)		

† From least-squares fit to Eγ's , assuming Δ(Eγ)=0.3 keV for each γ ray.
‡ Band(A): π5/2[422], α=+1/2.
# Band(a): π5/2[422], α=−1/2.
@ Band(B): π5/2[303].

γ(^{107}Tc)

Eγ	Iγ	Ei(level)	J_i^π	Ef	J_f^π	Mult.†	Comments
20		65.60	5/2⁺	45.59	5/2⁻		
45.6	35	45.59	5/2⁻	0.0	3/2⁻	M1+E2	α(K)exp=6.0 *15*
65.6	12	65.60	5/2⁺	0.0	3/2⁻		Eγ: doublet, other component belongs to a complementary iodine isotope.
71.3	68	137.0	7/2⁺	65.60	5/2⁺	M1+E2	α(K)exp=4.1 *8*
72.4	5	206.81	7/2⁻	134.40	5/2⁻	D	
134.4	17	134.40	5/2⁻	0.0	3/2⁻		
138.2	100	275.2	9/2⁺	137.0	7/2⁺	D	
159.6	30	727.5	13/2⁺	567.9	11/2⁺	D	(159.6γ)(292.7γ)(θ): A_2=+0.04 *2*, A_4=−0.05 *3*. (159.6γ)(431.0γ)(θ): A_2=−0.07 *3*, A_4=+0.01 *2*.
161.2	37	206.81	7/2⁻	45.59	5/2⁻	D	
187.0	7	1329.8	17/2⁺	1142.8	15/2⁺		
205.8	13	412.7	9/2⁻	206.81	7/2⁻		
206.8	15	206.81	7/2⁻	0.0	3/2⁻	Q	
209.7		275.2	9/2⁺	65.60	5/2⁺		
232.7	7	645.4	11/2⁻	412.7	9/2⁻		
288.6‡	4	934.1	13/2⁻	645.4	11/2⁻		
292.7	45	567.9	11/2⁺	275.2	9/2⁺	D	(292.7γ)(138.2γ)(θ): A_2=+0.03 *2*, A_4=−0.04 *3*.
367.1	19	412.7	9/2⁻	45.59	5/2⁻	Q	(367.1γ)(45.6γ)(θ): A_2=−0.06 *3*, A_4=0.00 *4*.
415.3	14	1142.8	15/2⁺	727.5	13/2⁺	D	(415.3γ)(452.3γ)(θ): A_2=−0.09 *3*, A_4=+0.08 *4*.
431.0	10	567.9	11/2⁺	137.0	7/2⁺	Q	(431.0γ)(71.3γ)(θ): A_2=−0.07 *3*, A_4=+0.03 *2*.
438.6	53	645.4	11/2⁻	206.81	7/2⁻	Q	(438.6γ)(72.4γ)(θ): A_2=−0.04 *2*, A_4=0.00 *3*. (438.6γ)(161.2γ)(θ): A_2=−0.06 *2*, A_4=+0.04 *3*. (438.6γ)(206.4γ)(θ): A_2=+0.09 *3*, A_4=−0.05 *3*.
452.3	39	727.5	13/2⁺	275.2	9/2⁺	Q	(452.3γ)(138.2γ)(θ): A_2=−0.03 *2*, A_4=+0.03 *3*.
521.4	12	934.1	13/2⁻	412.7	9/2⁻		
574.9	6	1142.8	15/2⁺	567.9	11/2⁺	Q	(574.9γ)(292.7γ)(θ): A_2=+0.03 *2*, A_4=−0.04 *3*.

Continued on next page (footnotes at end of table)

^{248}Cm SF decay 2004Ur07 (continued)

$\gamma(^{107}Tc)$ (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
582.6	29	1228.0	$15/2^-$	645.4	$11/2^-$	Q	(582.6γ)(438.6γ)(θ): A_2=+0.06 *3*, A_4=+0.03 *3*.
602.3	27	1329.8	$17/2^+$	727.5	$13/2^+$	Q	(602.3γ)(452.3γ)(θ): A_2=+0.09 *2*, A_4=−0.02 *3*.
661.6	7	1595.7	$(17/2^-)$	934.1	$13/2^-$	Q	(661.6γ)(367.1γ)(θ): A_2=+0.06 *2*, A_4=+0.04 *3*.
696.5[‡]		1839.3	$(19/2^+)$	1142.8	$15/2^+$		
713.0	8	1941.0	$(19/2^-)$	1228.0	$15/2^-$	Q	(713.0γ)(438.6γ)(θ): A_2=+0.07 *3*, A_4=0.00 *3*.
726.0	12	2055.8	$21/2^+$	1329.8	$17/2^+$	Q	(726.0γ)(452.3γ)(θ): A_2=+0.10 *2*, A_4=0.00 *3*.
741.5	2	3586.2		2844.6	$(25/2^+)$		
788.8	5	2844.6	$(25/2^+)$	2055.8	$21/2^+$		

[†] From $\gamma\gamma(\theta)$; mult=Q implies $\Delta J=2$, mult=D implies $\Delta J=1$ transition.
[‡] Placement of transition in the level scheme is uncertain.

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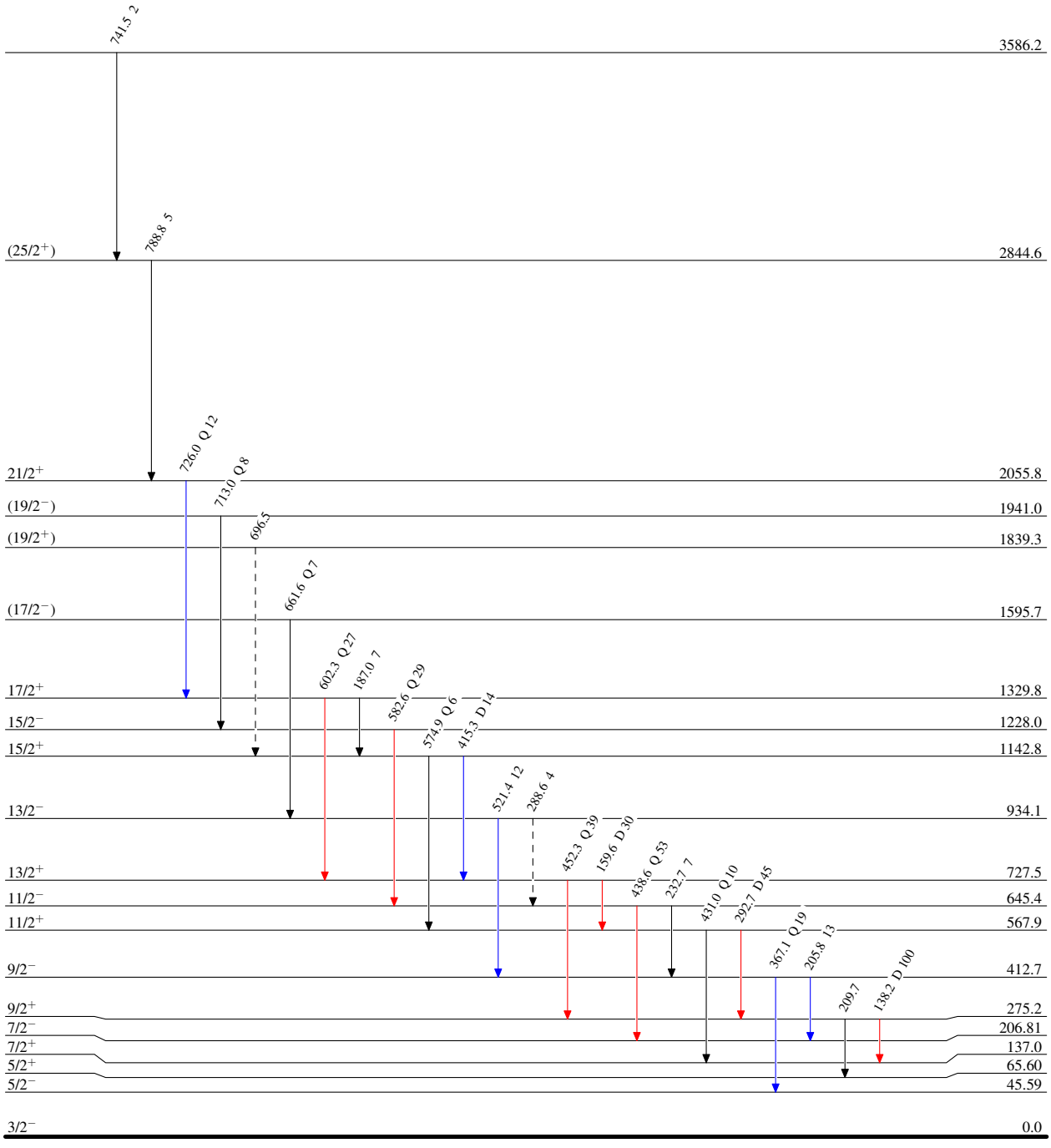
Level Scheme

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)



$^{107}_{43}Tc_{64}$

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Level Scheme (continued)

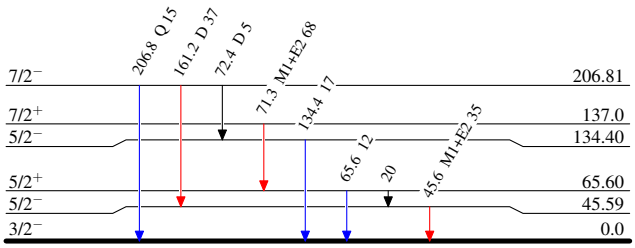
Intensities: Relative I_γ

Legend

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

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

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



$^{107}_{43}Tc_{64}$

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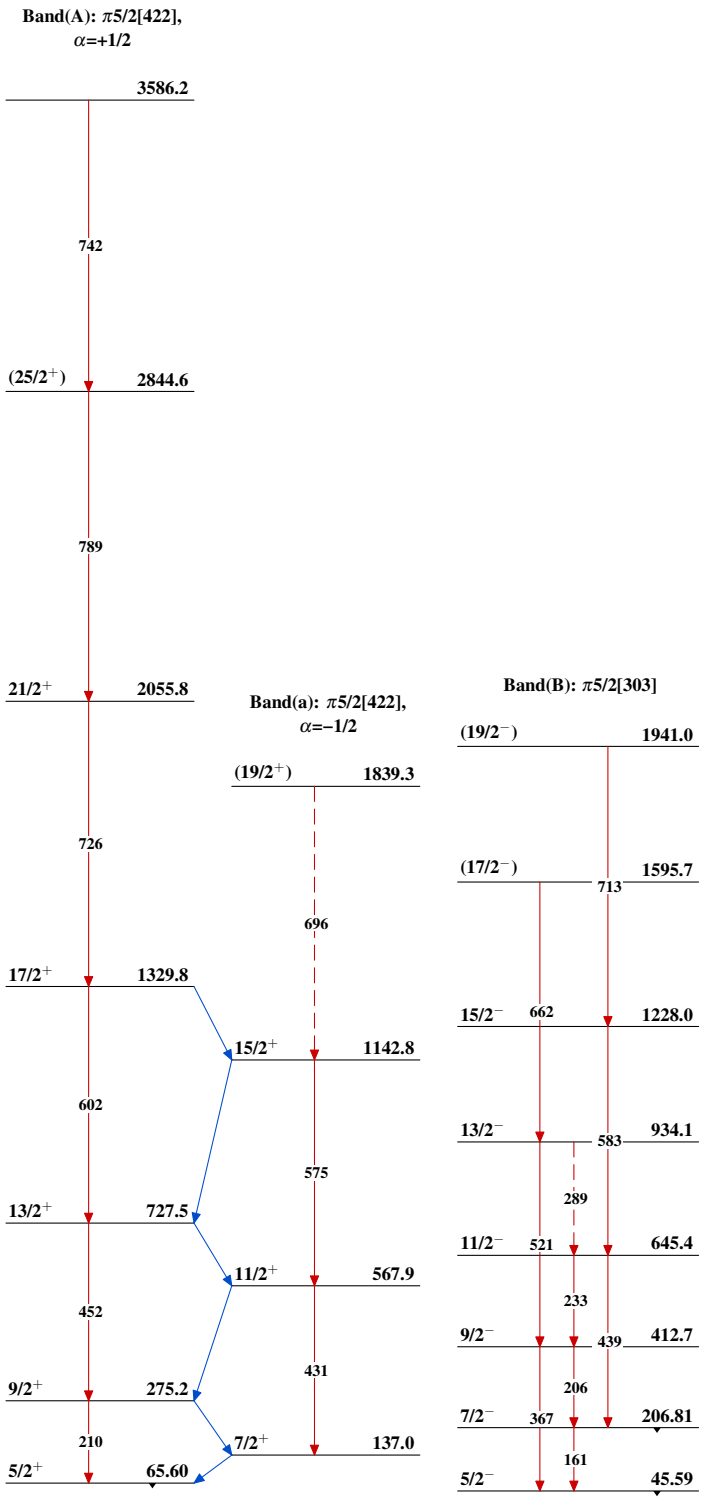

$^{107}_{43}Tc_{64}$