^{248}Cm SF decay 2004Ur06

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	ENSDF	1-Jul-2006

Parent: ^{248}Cm: E=0; $J^\pi=0^+$; $T_{1/2}=3.48\times10^5$ y *6*; %SF decay=?

2004Ur06: Measured Eγ, Iγ, γγ, γγ(θ) with the Eurogam-2 multidetector array.

1990Ho12: 6.5×10^4 fissions/s. Argonne Notre Dame γ facility 10 Bi-germanate-suppressed Ge detectors, 2 Leps, 1 array of 50 Bi-Ge scin used as a multiplicity filter. They select only fission fragments with an average γ multiplicity of ≈10. The assignment is mainly based on coin with complementary Ba isotopes.

^{252}Cf SF decay: 1974ClZX, 1973TaZG. Others: 1970Jo20, 1970HoZJ, 1971Ho29.

All data are from 2004Ur06, unless otherwise noted.

^{101}Zr Levels

E(level)†	Jπ‡	$T_{1/2}$	Comments
0.0#	(3/2+)		
98.12# *20*	(5/2+)		
216.53& *2*	(15/2−)		
231.75# *20*	(7/2+)		
320.85& *22*	(7/2−)		
408.17# *24*	(9/2+)		
467.44& *23*	(9/2−)		
610.39# *24*	(11/2+)		
619.57& *24*	(11/2−)		
786.1 *4*	(5/2,7/2)		
845.1 *4*	(7/2,9/2)		
858.6# *3*	(13/2+)		
869.3& *3*	(13/2−)		
941.81@ *23*	(9/2+)	16 ns *2*	$T_{1/2}$: from 2004Ur06. Jπ: spin from γγ(θ), parity from Weisskopf estimates.
1047.5& *4*	(15/2−)		
1076.9 *4*	(7/2,9/2)		
1120.8# *3*	(15/2+)		
1164.4@ *4*	(11/2+)		
1217.1 *4*	(7/2,9/2)		
1424.3@ *4*	(13/2+)		
1431.7& *4*	(17/2−)		
1436.9# *4*	(17/2+)		
1523.6 *4*	(11/2,13/2)		
1616.9& *4*	(19/2−)		
1719.9@ *4*	(15/2+)		
1749.8# *5*	(19/2+)		
1942.0 *5*			
2051.3@ *4*	(17/2+)		
2132.9# *5*	(21/2+)		
2151.8& *4*	(21/2−)		
2267.0 *6*			
2328.9& *5*	(23/2−)		
2416.3@ *5*			

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^{248}Cm SF decay 2004Ur06 (continued)

^{101}Zr Levels (continued)

E(level)[†]	Jπ[‡]
2487.8[#] *6*	(23/2+)
2787.0 *7*	

[†] From least-squares fit to Eγ's, assuming Δ(Eγ)=0.3 keV for each γ ray.
[‡] As given by the authors.
[#] Band(A): g.s., *ν*3/2[411] band.
[@] Band(B): *ν*9/2[404], Kπ=9/2+ isomer band. Q_0=3.6 *4*, β_2=0.38 *4*.
[&] Band(C): *ν*5/2[532] band.

γ(^{101}Zr)

Iγ normalization: From 1974ClZX.

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	Comments
98.12	(5/2+)	98.1		0.0	(3/2+)		
216.53	(15/2−)	118.4	13 *1*	98.12	(5/2+)		
		216.6	100 *5*	0.0	(3/2+)		
231.75	(7/2+)	133.6	100 *5*	98.12	(5/2+)		
		231.7	41 *3*	0.0	(3/2+)	Q	
320.85	(7/2−)	89.1	1.4 *2*	231.75	(7/2+)		
		104.3	100 *5*	216.53	(15/2−)		
		222.8	9.4 *5*	98.12	(5/2+)		
408.17	(9/2+)	176.4	88 *4*	231.75	(7/2+)		
		310.0	100 *5*	98.12	(5/2+)		(310.0γ)(98.1γ)(θ): A_2=−0.10 *1*, A_4=−0.04 *2*.
467.44	(9/2−)	146.6	100 *5*	320.85	(7/2−)		
		235.7	16 *1*	231.75	(7/2+)		
		251	27 *2*	216.53	(15/2−)	Q	
610.39	(11/2+)	143.2	10 *3*	467.44	(9/2−)		
		202.3	30 *4*	408.17	(9/2+)		(202.3γ)(310.0γ)(θ): A_2=−0.07 *1*, A_4=+0.04 *2*.
		378.6	100 *7*	231.75	(7/2+)		378.6γ-133.6 cascade is quadrupole (ΔJ=2)−dipole (ΔJ=1). (378.6γ)(133.6γ)(θ): A_2=−0.20 *1*, A_4=+0.07 *2*. (378.6γ)(231.7γ)(θ): A_2=+0.10 *1*, A_4=−0.08 *2*.
619.57	(11/2−)	152.1	100 *5*	467.44	(9/2−)		
		211.5	7 *2*	408.17	(9/2+)		
		298.7	91 *5*	320.85	(7/2−)	Q	(298.7γ)(104.3γ)(θ): A_2=−0.07 *1*, A_4=+0.04 *2*. (298.7γ)(222.8γ)(θ): A_2=−0.05 *2*, A_4=0.00 *2*.
786.1	(5/2,7/2)	688		98.12	(5/2+)		
845.1	(7/2,9/2)	747		98.12	(5/2+)		
858.6	(13/2+)	239	5 *2*	619.57	(11/2−)		
		248.5	45 *3*	610.39	(11/2+)		(248.5γ)(378.6γ)(θ): A_2=−0.06 *2*, A_4=−0.06 *2*.
		450.0	100 *5*	408.17	(9/2+)		E_γ: 450.5 in figure 4 of 2004Ur06. (450.0γ)(176.4γ)(θ): A_2=−0.13 *2*, A_4=+0.01 *2*. (450.0γ)(310.0γ)(θ): A_2=+0.10 *1*, A_4=+0.02 *2*; A_2=+0.06 *1*, A_4=+0.03 *2*.
869.3	(13/2−)	249.6	100 *6*	619.57	(11/2−)		(249.6γ)(298.7γ)(θ): A_2=−0.19 *2*, A_4=−0.04 *2*.
		401.8	95 *5*	467.44	(9/2−)	Q	(401.8γ)(251.0γ)(θ): A_2=+0.04 *2*, A_2=+0.02 *4*. (401.8γ)(146.6γ)(θ): A_2=−0.10 *1*, A_4=+0.04 *2*.
941.81	(9/2+)	322.3	13 *3*	619.57	(11/2−)	(E1)	B(E1)(W.u.)=2.6×10^{-8} *7*
		331.3	17 *3*	610.39	(11/2+)	(M1+E2)	

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^{248}Cm SF decay 2004Ur06 (continued)

γ(^{101}Zr) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	Comments
941.81	(9/2$^+$)	474.3	74 *5*	467.44	(9/2$^-$)		
		533.8	29 *2*	408.17	(9/2$^+$)		
		621	6 *2*	320.85	(7/2$^-$)		
		710.0	100 *5*	231.75	(7/2$^+$)	D	Mult.: ΔJ=1,0 from γγ(θ). 710.0γ-133.6 cascade is dipole (ΔJ=1)−dipole (ΔJ=1). (710.0γ)(231.7γ)(θ): A_2=−0.15 *4*, A_4=−0.02 *5*. (710.0γ)(133.6γ)(θ): A_2==0.33 *4*, A_4=−0.03 *5*.
		843.7	54 *4*	98.12	(5/2$^+$)	Q	843.7γ-98.0 cascade is quadrupole (ΔJ=2)−dipole (ΔJ=1). (843.7γ)(98.1γ)(θ): A_2=−0.08 *5*, A_4=+0.12 *7*.
1047.5	(15/2$^-$)	178.1	34 *3*	869.3	(13/2$^-$)		(178.1γ)(401.8γ)(θ): A_2=−0.24 *3*, A_4=+0.02 *4*.
		428.0	100 *5*	619.57	(11/2$^-$)	Q	(428.0γ)(152.1γ)(θ): A_2=−0.11 *2*, A_4=+0.05 *2*. (428.0γ)(298.7γ)(θ): A_2=+0.11 *2*, A_4=+0.06 *2*; A_2=+0.09 *1*, A_4=−0.03 *2*.
1076.9	(7/2,9/2)	756		320.85	(7/2$^-$)		
1120.8	(15/2$^+$)	262.1	52 *8*	858.6	(13/2$^+$)		(262.1γ)(450.5γ)(θ): A_2=−0.09 *3*, A_4=+0.08 *4*.
		510.5	100 *13*	610.39	(11/2$^+$)		(510.5γ)(202.3γ)(θ): A_2=−0.01 *2*, A_4=−0.07 *2*. (510.5γ)(378.6γ)(θ): A_2=+0.06 *1*, A_4=+0.01 *1*.
1164.4	(11/2$^+$)	222.6		941.81	(9/2$^+$)	D	(222.6γ)(710.0γ)(θ): A_2=+0.11 *2*, A_4=+0.03 *3*.
1217.1	(7/2,9/2)	1119		98.12	(5/2$^+$)		
1424.3	(13/2$^+$)	259.8	100 *6*	1164.4	(11/2$^+$)	D	(259.8γ)(222.6γ)(θ): A_2=+0.13 *2*, A_4=−0.04 *3*.
		482.5	42 *9*	941.81	(9/2$^+$)		
1431.7	(17/2$^-$)	384.2	34 *3*	1047.5	(15/2$^-$)		
		562.4	100 *6*	869.3	(13/2$^-$)	Q	(562.4γ)(401.8γ)(θ): A_2=+0.10 *2*, A_4=+0.15 *4*.
1436.9	(17/2$^+$)	316.1	20 *4*	1120.8	(15/2$^+$)		(316.1γ)(510.5γ)(θ): A_2=−0.22 *3*, A_4=+0.07 *4*.
		578.3	100 *6*	858.6	(13/2$^+$)		(578.3γ)(450.0γ)(θ): A_2=+0.13 *2*, A_4=−0.01 *3*.
1523.6	(11/2,13/2)	904		619.57	(11/2$^-$)		
1616.9	(19/2$^-$)	185.4	26 *5*	1431.7	(17/2$^-$)		
		569.5	100 *8*	1047.5	(15/2$^-$)	Q	(569.5γ)(428.0γ)(θ): A_2=+0.08 *2*, A_4=+0.06 *2*.
1719.9	(15/2$^+$)	295.6	100 *16*	1424.3	(13/2$^+$)	D	
		555.5	38 *8*	1164.4	(11/2$^+$)		(555.5γ)(222.6γ)(θ): A_2=−0.12 *3*, A_4=+0.16 *4*.
1749.8	(19/2$^+$)	629		1120.8	(15/2$^+$)		(629γ)(510.5γ)(θ): A_2=−0.01 *2*, A_4=0.00 *2*.
1942.0		777.6		1164.4	(11/2$^+$)	D	(777.6γ)(222.6γ)(θ): A_2=+0.23 *4*, A_4=−0.01 *5*.
2051.3	(17/2$^+$)	331.3	100 *6*	1719.9	(15/2$^+$)		
		627	25 *8*	1424.3	(13/2$^+$)		
2132.9	(21/2$^+$)	696.0		1436.9	(17/2$^+$)		
2151.8	(21/2$^-$)	535[‡]		1616.9	(19/2$^-$)		
		720		1431.7	(17/2$^-$)		
2267.0		325.0		1942.0		D	(325.0γ)(777.6γ)(θ): A_2=+0.40 *3*, A_4=+0.08 *3*.
2328.9	(23/2$^-$)	712		1616.9	(19/2$^-$)		
2416.3		365[‡]		2051.3	(17/2$^+$)		
2487.8	(23/2$^+$)	738		1749.8	(19/2$^+$)		
2787.0		520		2267.0			

[†] From γγ(θ), mult=Q implies ΔJ=2, mult=D implies ΔJ=1.
[‡] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

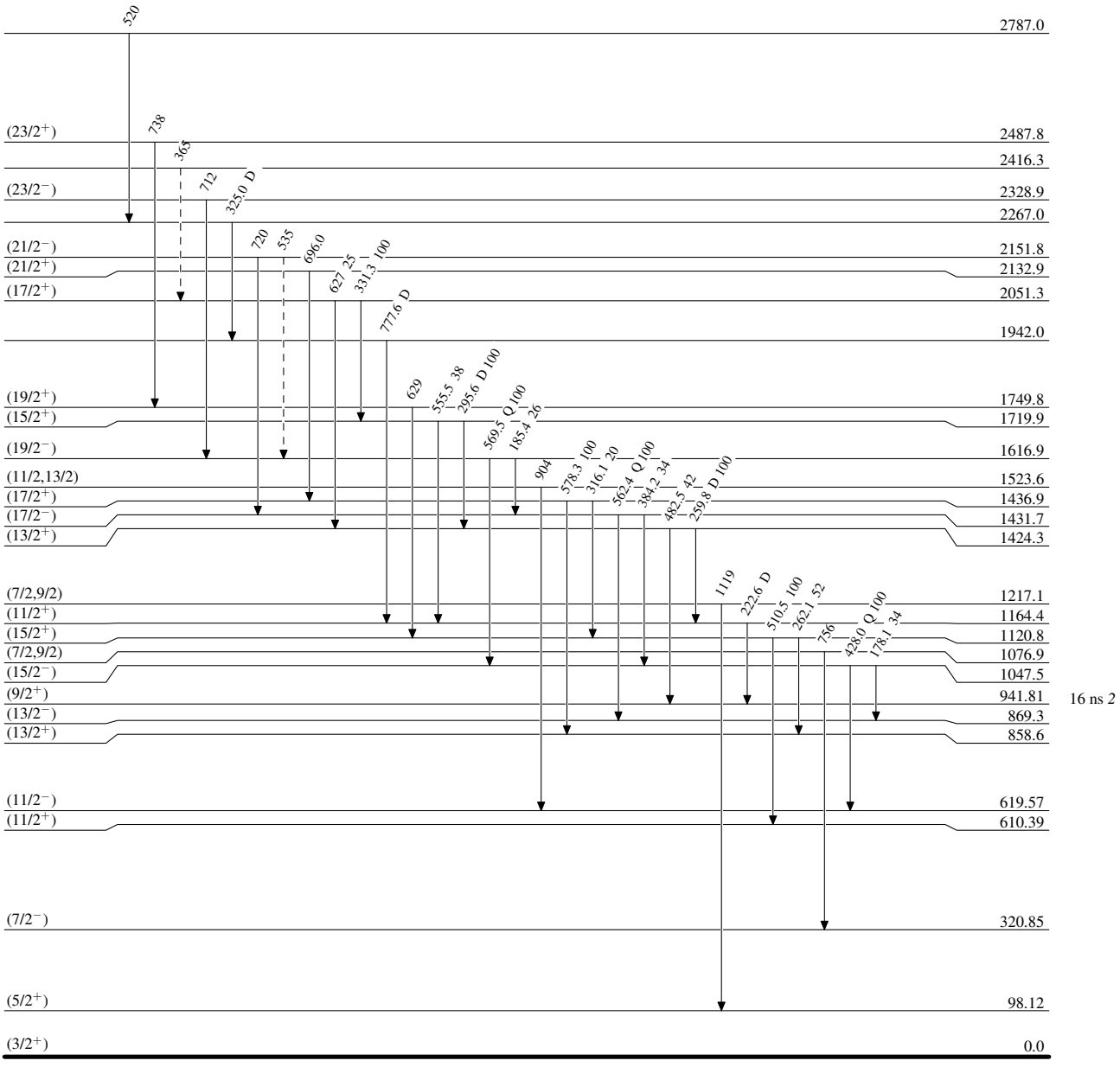
^{248}Cm SF decay 2004Ur06

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

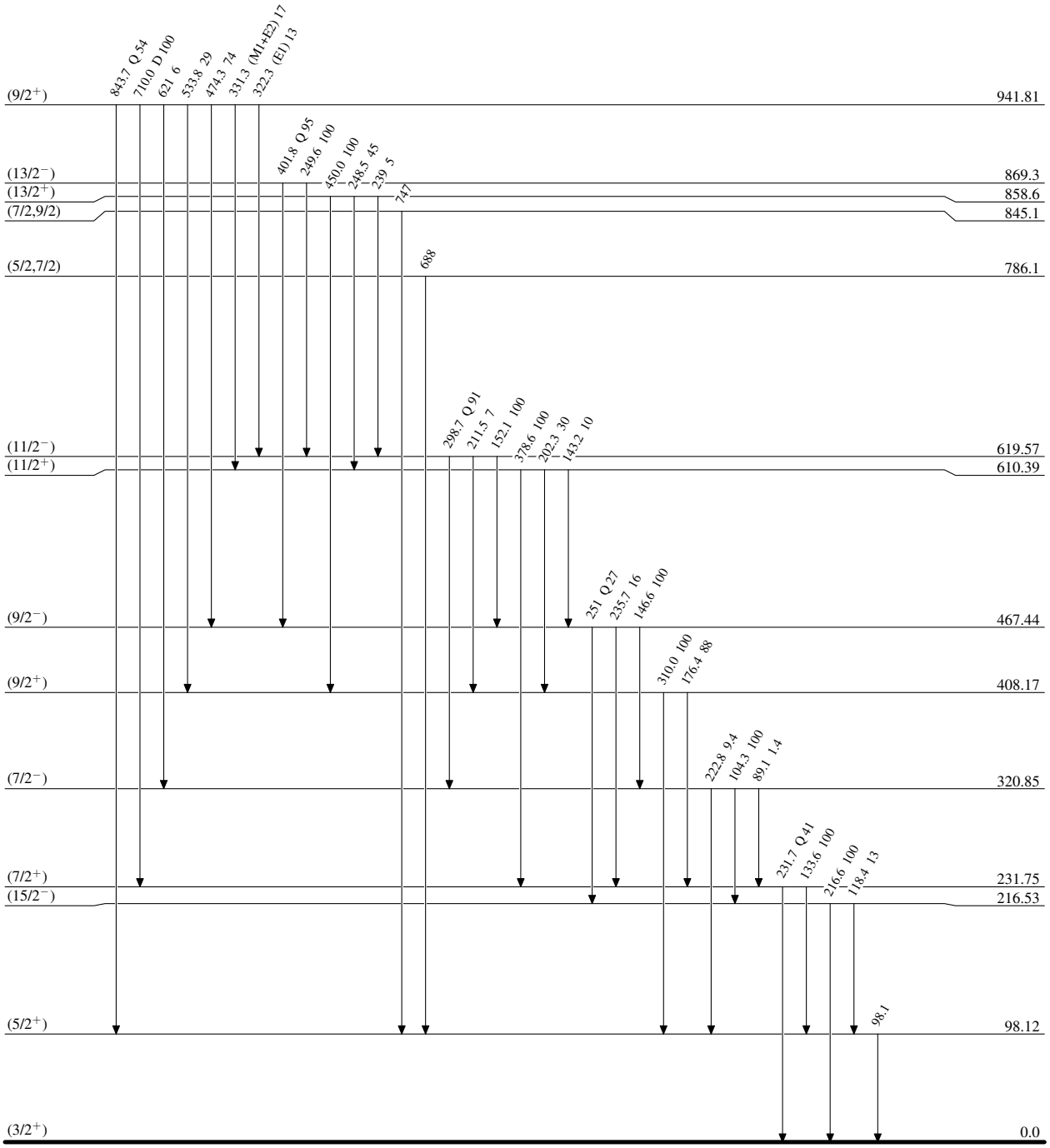


$^{101}_{40}Zr_{61}$

^{248}Cm SF decay 2004Ur06

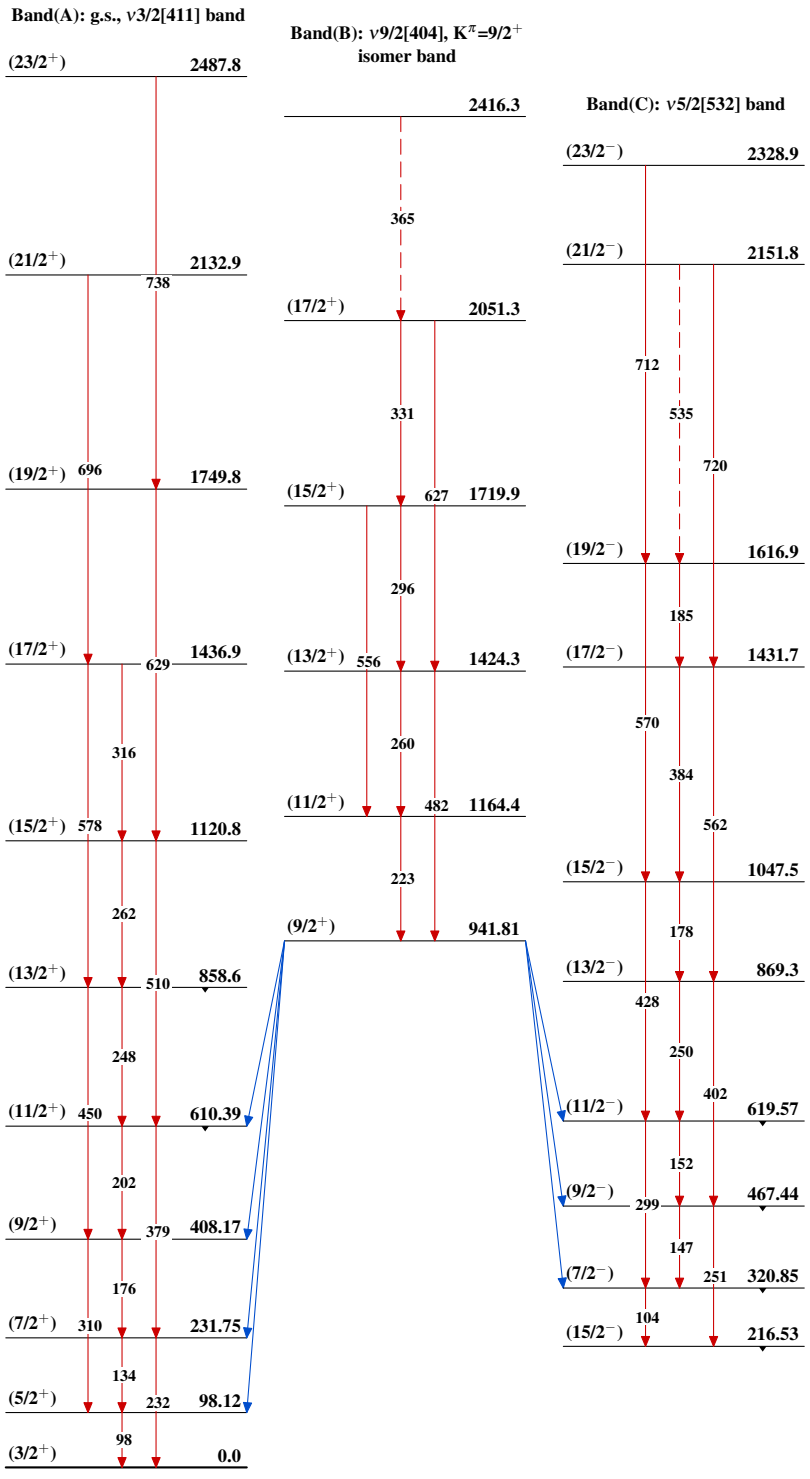
Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{101}_{40}Zr_{61}$

^{248}Cm SF decay 2004Ur06



$^{101}_{40}Zr_{61}$