^{248}Cm SF decay 2001Ur01,2003Ur01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 145, 25 (2017)	1-Jul-2017

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

Other: 1997Ur02, 2012Sm02.

Based on XUNDL. Compiled by: G. Reed and B. Singh (McMaster) March 19, 2003.

Measured Eγ, Iγ, γγ, γγ(θ), γγ(θ)(DCO) and linear polarization using EUROGAM-2 spectrometer comprised of 52 large Ge detectors in anti-Compton shields including 24 four-crystal (CLOVER) detectors and 4 LEPS detectors.

^{99}Zr Levels

E(level)†	J^π‡	$T_{1/2}$	Comments
0.0	$(1/2^+)$		
121.8 *2*	$(3/2^+)$		
252.0 *2*	$(7/2^+)$		
575.7 *2*	$3/2^+$		
614.1 *2*	$(3/2^-)$		
657.7 *3*	$(3/2^+)$		
667.4 *2*	$(5/2^-)$		
678.6 *3*	$(7/2^-)$		
821.3 *4*	$(11/2^-)$		E(level): 810.1 in Table 1 of 2001Ur01 is a misprint.
850.2 *3*	$(5/2^+)$		
852.1 *3*	$(5/2^+)$		
867.3 *3*	$(9/2^-)$		
1038.7# *3*	$(9/2^+)$	54 ns *10*	E(level),$T_{1/2}$: level and lifetime from 2003Ur01. Configuration=ν9/2[404] (2003Ur01).
1065.7 *3*	$(7/2^+)$		
1090.0 *5*	$(13/2^-)$		
1236.1 *5*	$(15/2^-)$		
1256.9# *4*	$(11/2^+)$		E(level): level from 2003Ur01.
1278.8? *5*	$(13/2^-)$		
1323.1 *4*	$(9/2^+)$		
1508.1# *4*	$(13/2^+)$		E(level): level from 2003Ur01.
1585.5 *4*	$(11/2^+)$		
1791.6# *4*	$(15/2^+)$		E(level): level from 2003Ur01.
1802.1 *6*	$(19/2^-)$	5.43 ps *74*	$T_{1/2}$: Statistical uncertainty is 0.50 ps, systematic uncertainty is 0.54 ps (2012Sm02).
1882.8? *6*	$(17/2^-)$		
1893.1 *5*	$(13/2^+)$		
2105.6# *5*	$(17/2^+)$		E(level): level from 2003Ur01.
2209.7 *5*	$(15/2^+)$		
2516.2 *7*	$(23/2^-)$	1.59 ps *22*	$T_{1/2}$: Statistical uncertainty is 0.15 ps, systematic uncertainty is 0.16 ps (2012Sm02).
2557.1 *6*	$(17/2^+)$		
3360.2 *12*	$(27/2^-)$		

† Deduced by evaluators from least-squares fit to γ-ray energies assuming Δ(Eγ)=0.3 keV for each γ ray.

‡ From Adopted Levels. Some J^π assignments may be different from those given in 2001Ur01 or 2003Ur01.

Band(A): $9/2^+$ band (2003Ur01).

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γ(^{99}Zr)

For the geometry of the detectors used, DCO(calculated)=0.89 for ΔJ=2, Q; 1.09 for ΔJ=1, dipole and 0.81 for ΔJ=0, dipole.
POL(calculated)=+0.14 for ΔJ=2, E2; +0.09 for ΔJ=1, E1; −0.09 for ΔJ=1, M1; −0.25 for ΔJ=0, E1 and +0.25 for ΔJ=0, M1.

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Comments
(11.2‡)		678.6	(7/2⁻)	667.4	(5/2⁻)	
(20.9‡)		678.6	(7/2⁻)	657.7	(3/2⁺)	
46.0	6 *2*	867.3	(9/2⁻)	821.3	(11/2⁻)	
53.3	65 *8*	667.4	(5/2⁻)	614.1	(3/2⁻)	
64.6	17 *4*	678.6	(7/2⁻)	614.1	(3/2⁻)	
91.7	12 *2*	667.4	(5/2⁻)	575.7	3/2⁺	
121.7	100 *5*	121.8	(3/2⁺)	0.0	(1/2⁺)	
130.3	7 *1*	252.0	(7/2⁺)	121.8	(3/2⁺)	DCO=0.90 *4*.
142.7	96 *5*	821.3	(11/2⁻)	678.6	(7/2⁻)	A_2=+0.06 *1*. A_4=0.00 *2*.
188.5		1038.7	(9/2⁺)	850.2	(5/2⁺)	Iγ(188)/Iγ(381)=0.45 *4* (2003Ur01).
189.0	8 *1*	867.3	(9/2⁻)	678.6	(7/2⁻)	
192.6	29 *2*	850.2	(5/2⁺)	657.7	(3/2⁺)	A_2=+0.01 *2*. A_4=+0.4 *2*.
194.0 *3*	5 *2*	852.1	(5/2⁺)	657.7	(3/2⁺)	(193)(536)(θ): A_2=+0.14 *2*, A_4=+0.06 *3* (2003Ur01).
199.7	8 *1*	867.3	(9/2⁻)	667.4	(5/2⁻)	
215.5	6 *1*	1065.7	(7/2⁺)	850.2	(5/2⁺)	
218.0		1256.9	(11/2⁺)	1038.7	(9/2⁺)	
251.1		1508.1	(13/2⁺)	1256.9	(11/2⁺)	
257.4	5 *1*	1323.1	(9/2⁺)	1065.7	(7/2⁺)	
262.5	3 *1*	1585.5	(11/2⁺)	1323.1	(9/2⁺)	
268.7	9 *1*	1090.0	(13/2⁻)	821.3	(11/2⁻)	
274.5	4 *1*	850.2	(5/2⁺)	575.7	3/2⁺	
274.5		852.1	(5/2⁺)	575.7	3/2⁺	
283.3		1791.6	(15/2⁺)	1508.1	(13/2⁺)	
308†#		1893.1	(13/2⁺)	1585.5	(11/2⁺)	
313.8		2105.6	(17/2⁺)	1791.6	(15/2⁺)	
360.1		1038.7	(9/2⁺)	678.6	(7/2⁻)	Iγ(360)/Iγ(381)=0.82 *6* (2003Ur01).
381.1#		1038.7	(9/2⁺)	657.7	(3/2⁺)	E_γ: Transition not adopted. Its placement is discrepant with adopted J^π. (381)(536)(θ): A_2=−0.09 *4*, A_4=−0.04 *5* (2003Ur01).
405.8	3 *1*	657.7	(3/2⁺)	252.0	(7/2⁺)	
408.0	12 *1*	1065.7	(7/2⁺)	657.7	(3/2⁺)	(408)(536)(θ): A_2=−0.05 *2*, A_4=+0.007 *4* (2003Ur01).
411.5	22 *2*	1278.8?	(13/2⁻)	867.3	(9/2⁻)	A_2=+0.2 *1*. A_4=0.00 *4*.
414.8	54 *3*	1236.1	(15/2⁻)	821.3	(11/2⁻)	
415.5	4 *2*	667.4	(5/2⁻)	252.0	(7/2⁺)	
426.6	5 *2*	678.6	(7/2⁻)	252.0	(7/2⁺)	
453.8	11 *1*	575.7	3/2⁺	121.8	(3/2⁺)	
469.6		1508.1	(13/2⁺)	1038.7	(9/2⁺)	Iγ(470)/Iγ(251)=0.36 *4* (2003Ur01).
472.8	9 *1*	1323.1	(9/2⁺)	850.2	(5/2⁺)	
519.8	9 *1*	1585.5	(11/2⁺)	1065.7	(7/2⁺)	A_2=+0.10 *2*. A_4=−0.03 *2*. POL=+0.2 *1*.
534.5		1791.6	(15/2⁺)	1256.9	(11/2⁺)	Iγ(534)/Iγ(283)=0.70 *8* (2003Ur01).
536.0	46 *3*	657.7	(3/2⁺)	121.8	(3/2⁺)	A_2=−0.91 *1*. A_4=+0.01 *1*. POL=−0.2 *1*.
545.5	5 *1*	667.4	(5/2⁻)	121.8	(3/2⁺)	
566.0	28 *2*	1802.1	(19/2⁻)	1236.1	(15/2⁻)	A_2=+0.08 *2*.

Continued on next page (footnotes at end of table)

^{248}Cm SF decay 2001Ur01,2003Ur01 (continued)

$\gamma(^{99}Zr)$ (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Comments
						A_4=+0.02 *2*. POL=+0.08 *4*.
570.0	7 *2*	1893.1	(13/2$^+$)	1323.1	(9/2$^+$)	A_2=+0.014 *5*. A_4=+0.01 *3*.
575.7	21 *2*	575.7	3/2$^+$	0.0	(1/2$^+$)	
597.7		2105.6	(17/2$^+$)	1508.1	(13/2$^+$)	Iγ(598)/Iγ(314)=0.16 *12* (2003Ur01).
604.0	10 *2*	1882.8?	(17/2$^-$)	1278.8?	(13/2$^-$)	
614.1	64 *3*	614.1	(3/2$^-$)	0.0	(1/2$^+$)	
624.2	7 *2*	2209.7	(15/2$^+$)	1585.5	(11/2$^+$)	A_2=+0.07 *2*. A_4=+0.02 *2*.
658[†#]		657.7	(3/2$^+$)	0.0	(1/2$^+$)	
664.0	4 *1*	2557.1	(17/2$^+$)	1893.1	(13/2$^+$)	
714.1	9 *1*	2516.2	(23/2$^-$)	1802.1	(19/2$^-$)	A_2=+0.15 *5*. A_4=−0.01 *3*.
786.8		1038.7	(9/2$^+$)	252.0	(7/2$^+$)	Iγ(787)/Iγ(381)=0.93 *7* (2003Ur01).
844	8 *2*	3360.2	(27/2$^-$)	2516.2	(23/2$^-$)	

† From Figure 5 in 2001Ur01.
‡ Expected from $\gamma\gamma$ coincidence. Eγ from level-energy difference.
# Placement of transition in the level scheme is uncertain.

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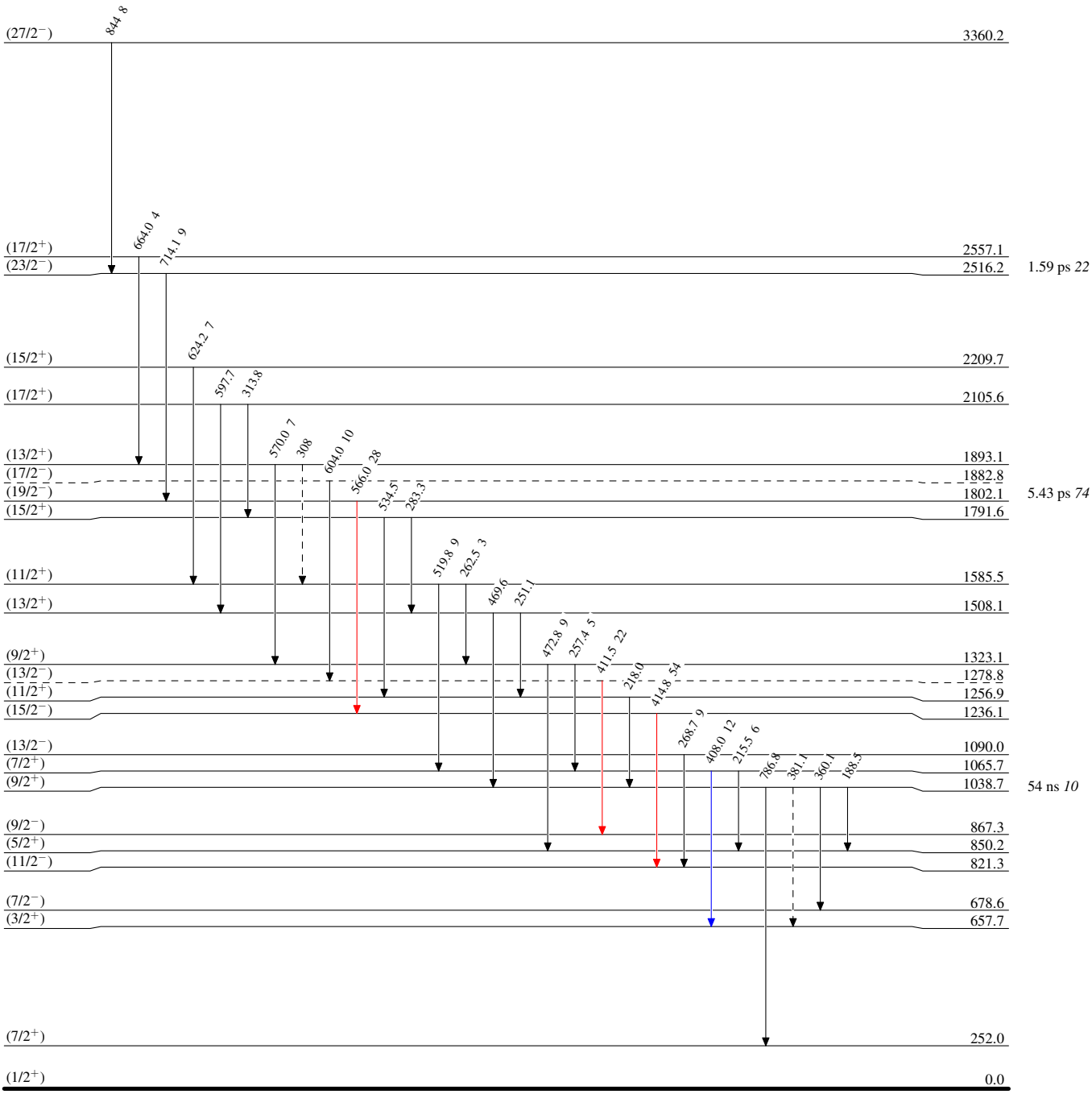
Level Scheme

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)



$^{99}_{40}Zr_{59}$

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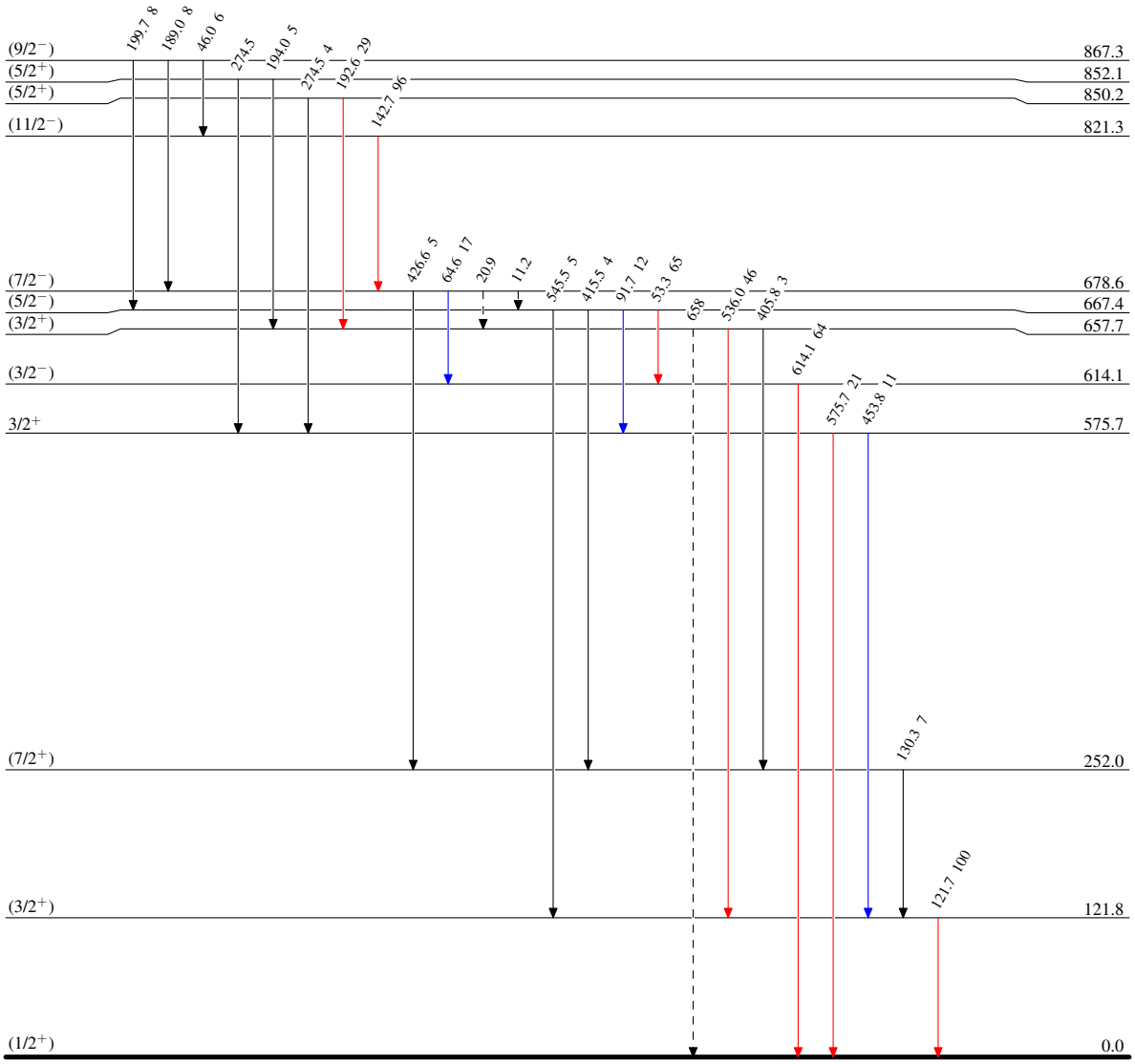
Level Scheme (continued)

Intensities: Relative I_γ

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



$^{99}_{40}Zr_{59}$

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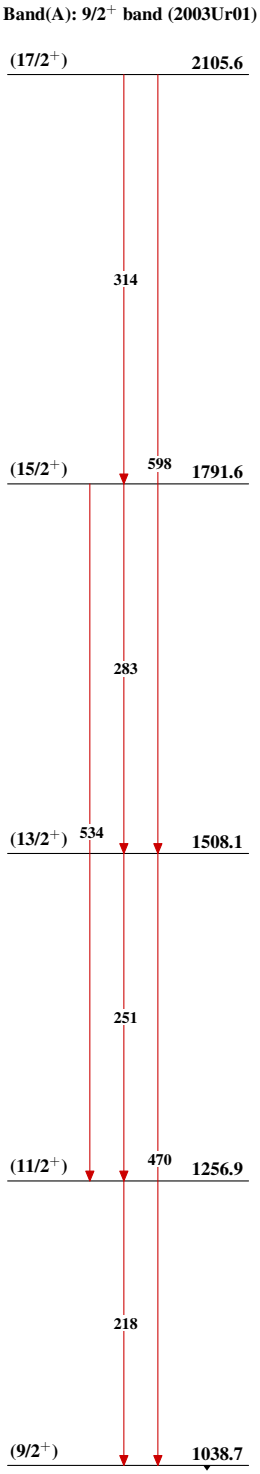

$^{99}_{40}Zr_{59}$