^{127}I(α,2nγ) 1977Ch23

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Janos Timar and Zoltan Elekes, Balraj Singh	NDS 121, 143 (2014)	31-May-2014

1977Ch23: E=28 MeV, natural target, γ, $\gamma\gamma$, $\gamma\gamma$(t)-coin, $\gamma(\theta)$, γ(t), excitation function.

Others:

1979Ga01 (also 1979GaZP thesis): high-spin levels in ^{129}Cs studied using ^{127}I(α,2nγ), ^{126}Te(^{6}Li,3nγ) and ^{122}Sn(^{10}B,3nγ) reactions, but no data are presented, except that for half-life of 575-keV isomer.

1978De29: E=22 MeV; measured spin rotation in $\gamma(\theta$,H,t). deduced g and half-life for 575-keV isomer.

^{129}Cs Levels

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$	Comments
0.0	1/2$^+$		
6.55[&] *5*	5/2$^+$		
188.63[b] *21*	7/2$^+$		
208.6[a] *3*	5/2$^+$		
426.15[&] *22*	9/2$^+$		
575.08[#] *22*	11/2$^-$	0.718 μs *21*	%IT=100 $T_{1/2}$: from $\gamma\gamma$(t); weighted average of 0.734 μs *23* (1978De29), and 0.69 μs *3* (1977Ch23). Other: 0.73 μs *7* (1979Ga01, same group as 1978De29).
647.4[b] *4*	11/2$^+$		
689.4[a] *3*	9/2$^+$		
1023.0[#] *4*	15/2$^-$		
1031.7[&] *4*	13/2$^+$		
1149.7[@] *4*	13/2$^-$		
1277.8[b] *5*	15/2$^+$		
1337.9[a] *5*	13/2$^+$		
1626.8[#] *5*	19/2$^-$		
1690.5 *5*	17/2$^-$		
1693.1[@] *5*	(15/2$^-$)		
1790.7[&] *5*	17/2$^+$		
2045.6[b] *6*	19/2$^+$		
2120.3[a] *5*	17/2$^+$		
2212.8? *6*			
2318.6? *6*			
2348.9? *6*			E(level): level not included in Adopted Levels. A 658.3γ is placed from a level at 3291 keV; and a 659.0γ from 1890 level in Adopted dataset.

[†] From least-squares fit to Eγ data, assuming 0.3 keV uncertainty for each γ ray.

[‡] As assigned in 1977Ch23.

[#] Band(A): Band based on 1h$_{11/2}$,α=−1/2.

[@] Band(a): Band based on 1h$_{11/2}$,α=+1/2.

[&] Band(B): Band based on 5/2$^+$.

[a] Band(C): Band based on 5/2$^+$,α=+1/2.

[b] Band(c): Band based on 5/2$^+$,α=+1/2.

^{127}I(α,2nγ) 1977Ch23 (continued)

$\gamma(^{129}Cs)$

When only A_2 is given, A_4 is set to zero.

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[‡]	Comments
6.55 *5*		6.55	5/2$^+$	0.0	1/2$^+$			E_γ: from Adopted Gammas.
148.6	51	575.08	11/2$^-$	426.15	9/2$^+$	(E1)	0.0722 *12*	A_2=−0.13 *5* Mult.: from $\gamma(\theta)$ and ΔJ^π.
182.0	100	188.63	7/2$^+$	6.55	5/2$^+$			A_2=+0.02 *2*
202.1	15	208.6	5/2$^+$	6.55	5/2$^+$			A_2=+0.10 *10*
237.3	24	426.15	9/2$^+$	188.63	7/2$^+$			A_2=+0.02 *5*
386.6	34	575.08	11/2$^-$	188.63	7/2$^+$	[M2]	0.0864	A_2=−0.01 *5*
419.5	87	426.15	9/2$^+$	6.55	5/2$^+$			A_2=+0.07 *3*
447.9	58	1023.0	15/2$^-$	575.08	11/2$^-$	(E2)		A_2=+0.28 *5*
458.8	45	647.4	11/2$^+$	188.63	7/2$^+$	(E2)		A_2=+0.22 *5*
480.8	11	689.4	9/2$^+$	208.6	5/2$^+$	(E2)		A_2=+0.26 *10*
500.8	5	689.4	9/2$^+$	188.63	7/2$^+$	D		A_2=−0.14 *10*
522.3[#]	3	2212.8?		1690.5	17/2$^-$			$A_2\approx-1$
543.4	17	1693.1	(15/2$^-$)	1149.7	13/2$^-$	D		A_2=−0.09 *5*
568.7	6.5	575.08	11/2$^-$	6.55	5/2$^+$	[E3]	0.0175	A_2=+0.06 *10*
574.6	19	1149.7	13/2$^-$	575.08	11/2$^-$	D+Q		A_2=−0.55 *15*
603.8	27	1626.8	19/2$^-$	1023.0	15/2$^-$			
605.5	20	1031.7	13/2$^+$	426.15	9/2$^+$	(Q)		A_2=+0.24 *10*
630.4	26	1277.8	15/2$^+$	647.4	11/2$^+$	(Q)		A_2=+0.32 *5*
648.5	10	1337.9	13/2$^+$	689.4	9/2$^+$	(Q)		A_2=+0.31 *10*
658.4[#]	8.5	2348.9?		1690.5	17/2$^-$			A_2=+0.29 *10*
667.5	15	1690.5	17/2$^-$	1023.0	15/2$^-$	D+Q		A_2=−0.61 *15*
691.8[#]	≈10	2318.6?		1626.8	19/2$^-$			$A_2\approx-0.3$
759.0	8	1790.7	17/2$^+$	1031.7	13/2$^+$	(Q)		A_2=+0.34 *10*
767.8	19	2045.6	19/2$^+$	1277.8	15/2$^+$	(Q)		A_2=+0.25 *5*
782.4	5.5	2120.3	17/2$^+$	1337.9	13/2$^+$	(Q)		A_2=+0.22 *10*

[†] Evaluators assign (E2) for positive A_2 and (M1+E2) for large negative A_2 values for Eγ<500 keV or so, assuming level half-life is less than 10 ns or so. Above this Eγ, (Q) and D+Q are assigned from $\gamma(\theta)$ results. See also Adopted Gammas.

[‡] 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.

[#] Placement of transition in the level scheme is uncertain.

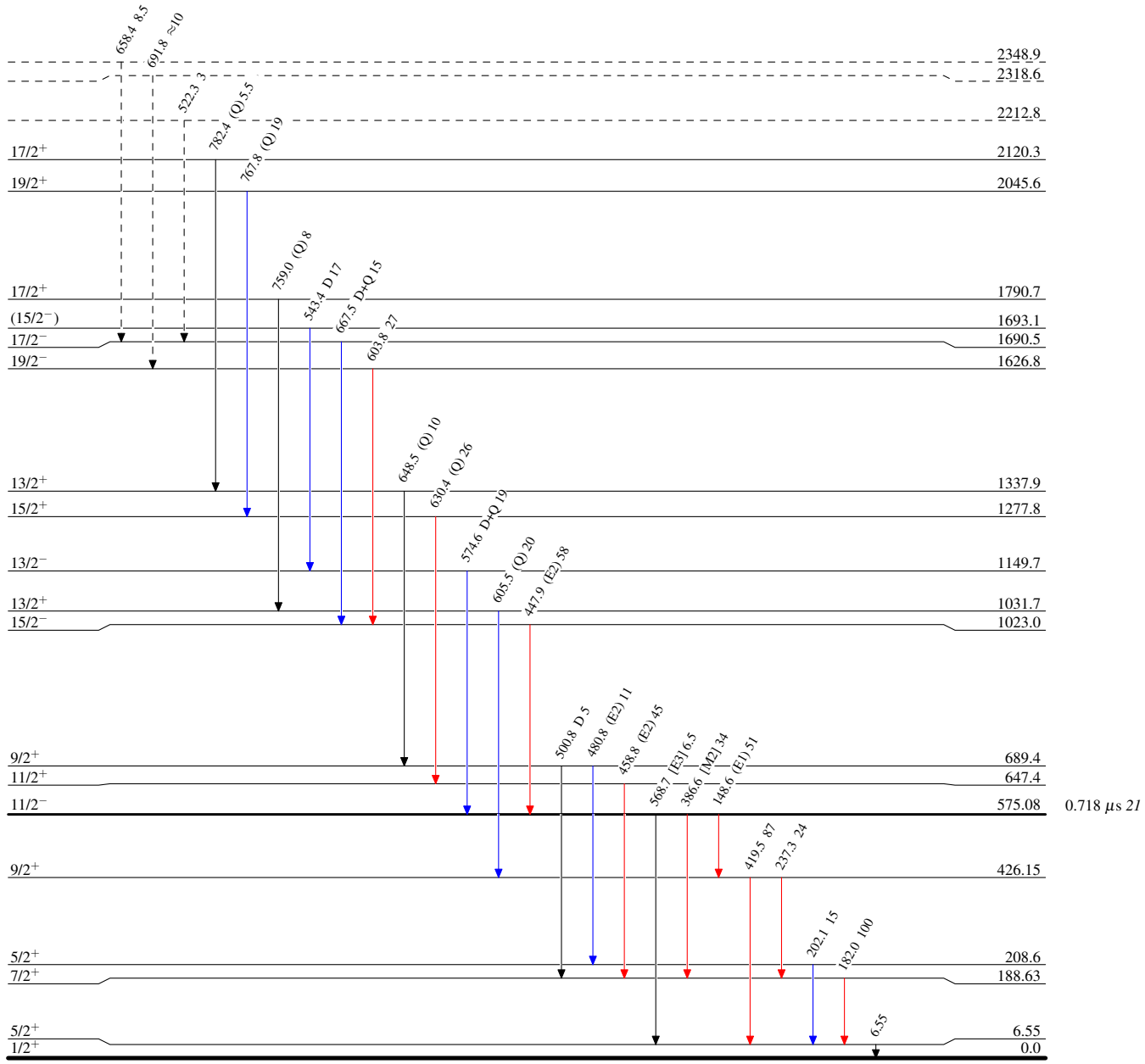
^{127}I(α,2nγ) 1977Ch23

Level Scheme

Intensities: Relative I_γ

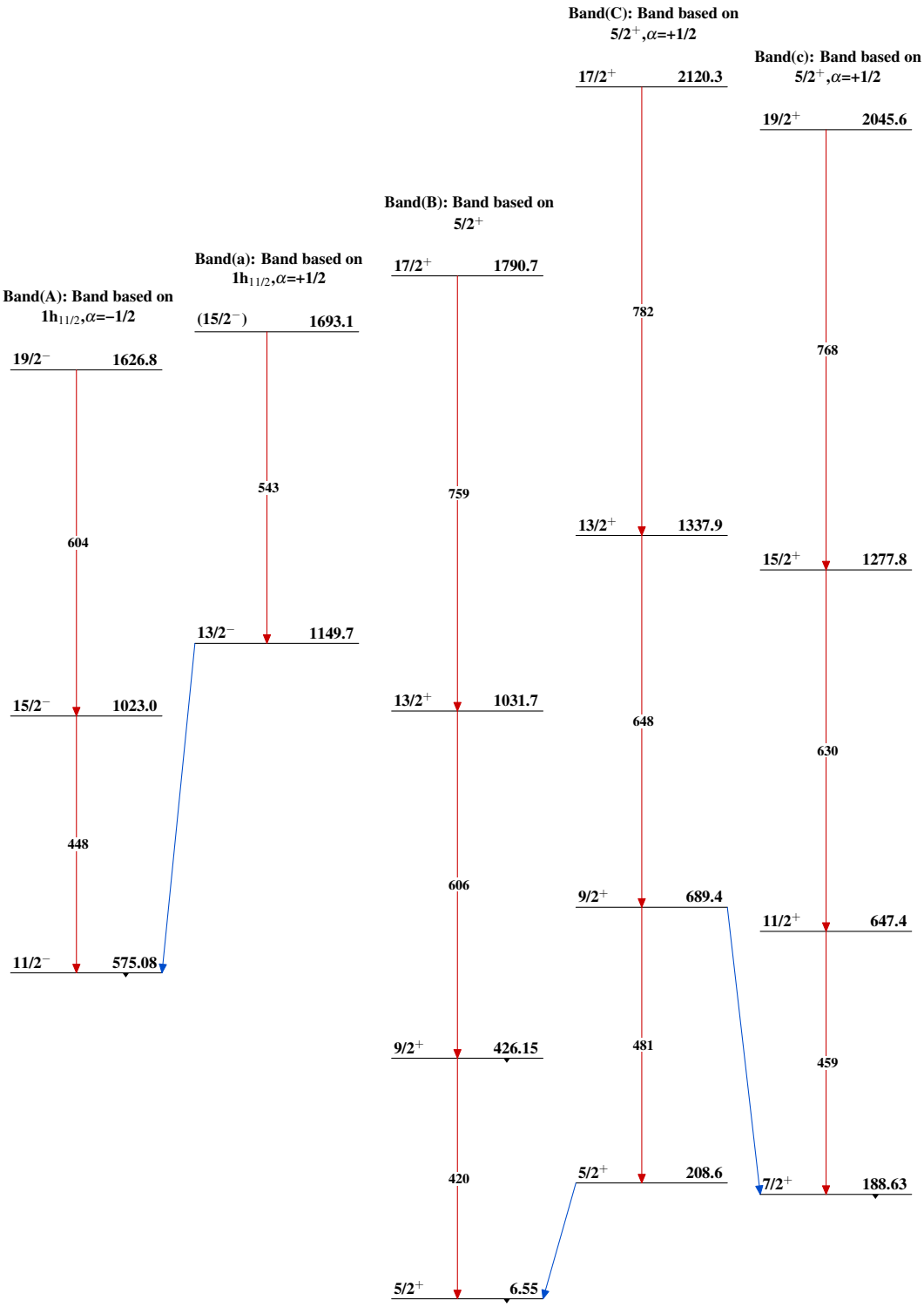
Legend

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



$^{129}_{55}Cs_{74}$

^{127}I(α,2nγ) 1977Ch23



$^{129}_{55}Cs_{74}$