^{136}Ce(^{16}O,3nγ) 1980Da18,1983JuZY

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 185, 2 (2022)	23-Aug-2022

1980Da18 (also 1983JuZY): E=92 MeV ^{16}O beam from the Emperor Tandem at the MPI Heidelberg on >99% enriched ^{136}Xe target (in oxide form); measured conversion electrons with a solenoid spectrometer. Deduced levels, J^π, isomer $T_{1/2}$, configurations, conversion coefficients, γ-ray multipolarities, transition strengths. Systematics of neighboring isotones. See also the ^{152}Gd(α,7nγ) dataset for additional data from this work.

Level scheme is based on results from 1980Da18 up to 3885 level and from 1983JuZY above that, which is a substantial revision of a tentative scheme proposed by 1981Ha17 in ^{120}Sn(^{32}S,3nγ). However, details of the results from 1983JuZY are not available. The order of the 741γ-491γ cascade tentatively proposed in 1981Ha17, resulting an intermediate level at 6669, has been reversed based on later studies by 1996Gu17 in ^{122}Sn(^{32}S,5nγ) and 2002Go06 in ^{141}Pr(^{16}O,p7nγ), resulting an intermediate level at 6919, instead.

^{149}Dy Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0.0	7/2$^-$		
1073.20 *20*	13/2$^+$	12.5 ns *15*	$T_{1/2}$: from $\gamma\gamma$(t) (1980Da18). Other: 13 ns *3* in (1976St01).
2251.81 *23*	17/2$^+$		
2550.41 *25*	21/2$^+$		
2661.2 *5*	27/2$^-$	0.490 s *15*	$T_{1/2}$: from the Adopted Levels.
3645.5 *5*	29/2$^+$		
3885.5 *6*	(31/2$^+$)		J$^\pi$: 1980Da18 give 31/2.
4084.9 *7*	(33/2$^+$)		
5222.8 *7*	(35/2$^+$)		
5478.0 *7*	(37/2$^+$)		
5747.9 *7*	(39/2$^+$)		
5929.6? *7*			
6178.0 *7*	(41/2$^+$)		
6919.1 *8*			
7242.2? *8*			
7410.0 *8*	(43/2$^+$)		

[†] From a least-squares fit to γ-ray energies, assuming $\Delta E\gamma$=0.3 keV where not available.
[‡] As given in 1980Da18 for levels below 4 MeV, based on $\gamma(\theta)$ data in 1980Da18 and 1976St08, and ce data in (^{16}O,3nγ) study by 1980Da18. Above 3.8 MeV, excitations, the assignments are from the Adopted Levels.

γ(^{149}Dy)

E$_\gamma$[†]	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[†]	α[&]	Comments
110.8 *4*		2661.2	27/2$^-$	2550.41	21/2$^+$	E3	27.3 *7*	α(K)exp=22 *7* (1976St08); α(L)exp=13 *5* (1980Da18) α(K)=3.07 *5*; α(L)=18.4 *5*; α(M)=4.63 *12* α(L)exp=16 *4* (1987BaZV), from comparison with 298.6γ intensity.
167.8[#]		7410.0	(43/2$^+$)	7242.2?				
199.4[‡] *3*	50 *10*	4084.9	(33/2$^+$)	3885.5	(31/2$^+$)	(M1)[@]	0.342 *5*	
240.0 *3*	80 *20*	3885.5	(31/2$^+$)	3645.5	29/2$^+$	(M1)[@]	0.2060 *30*	
248.4[#]		6178.0	(41/2$^+$)	5929.6?				
255.0[‡] *2*	32 *9*	5478.0	(37/2$^+$)	5222.8	(35/2$^+$)	(M1)[@]	0.1748 *25*	
270.0[‡] *2*	42 *4*	5747.9	(39/2$^+$)	5478.0	(37/2$^+$)	(M1)	0.1498 *21*	α(K)exp=0.080 *15* (1980Da18)

Continued on next page (footnotes at end of table)

^{136}Ce(^{16}O,3nγ) 1980Da18,1983JuZY (continued)

$\gamma(^{149}Dy)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[&]	Comments
								α(K)=0.1264 *18*; α(L)=0.01826 *26*; α(M)=0.00401 *6* δ(E2/M1)>0.8 from α(K)exp in (1980Da18); 1983JuZY assign M1.
298.6 *1*	80 *8*	2550.41	21/2$^+$	2251.81	17/2$^+$	E2	0.0654 *9*	α(K)exp=0.049 *7* (1980Da18) α(K)=0.0490 *7*; α(L)=0.01276 *18*; α(M)=0.00294 *4*
430.3[‡] *2*	18 *6*	6178.0	(41/2$^+$)	5747.9	(39/2$^+$)	(M1)[@]	0.0437 *6*	
451.7[#]		5929.6?		5478.0	(37/2$^+$)			
491.0[#]		7410.0	(43/2$^+$)	6919.1				
525.1[#]		5747.9	(39/2$^+$)	5222.8	(35/2$^+$)			
699.8[#]		6178.0	(41/2$^+$)	5478.0	(37/2$^+$)			
741.1[#]		6919.1		6178.0	(41/2$^+$)			
984.3 *2*	78 *8*	3645.5	29/2$^+$	2661.2	27/2$^-$	E1	1.29×10^{-3} *2*	α(K)exp=0.0011 *2* (1980Da18) α(K)=0.001099 *15*; α(L)=0.0001459 *20*; α(M)=3.17×10^{-5} *4*
1064.2[#]		7242.2?		6178.0	(41/2$^+$)			
1073.2 *2*	100	1073.20	13/2$^+$	0.0	7/2$^-$	E3	0.00557 *8*	α(K)exp=0.0046 *5* (1980Da18) α(K)=0.00456 *6*; α(L)=0.000788 *11*; α(M)=0.0001763 *25*
1137.8[#]		5222.8	(35/2$^+$)	4084.9	(33/2$^+$)			
1178.6 *1*	95 *10*	2251.81	17/2$^+$	1073.20	13/2$^+$	E2	2.18×10^{-3} *3*	α(K)exp=0.0017 *3* (1980Da18) α(K)=0.001840 *26*; α(L)=0.000265 *4*; α(M)=5.81×10^{-5} *8*
1231.8[#]		7410.0	(43/2$^+$)	6178.0	(41/2$^+$)			
1337.2[‡] *4*	35 *6*	5222.8	(35/2$^+$)	3885.5	(31/2$^+$)			
1393.7[‡] *5*	30 *3*	5478.0	(37/2$^+$)	4084.9	(33/2$^+$)	E2	1.61×10^{-3} *2*	α(K)exp=0.0011 *4* (1980Da18) α(K)=0.001330 *19*; α(L)=0.0001868 *26*; α(M)=4.08×10^{-5} *6* Mult.: from α(K)exp.

[†] From 1980Da18, unless otherwise stated. Multipolarities are determined based on ce data and intensities are obtained in-beam (1 μs pulse) (1980Da18).

[‡] Unplaced in 1980Da18 and placed by 1983JuZY.

[#] From 1983JuZY only.

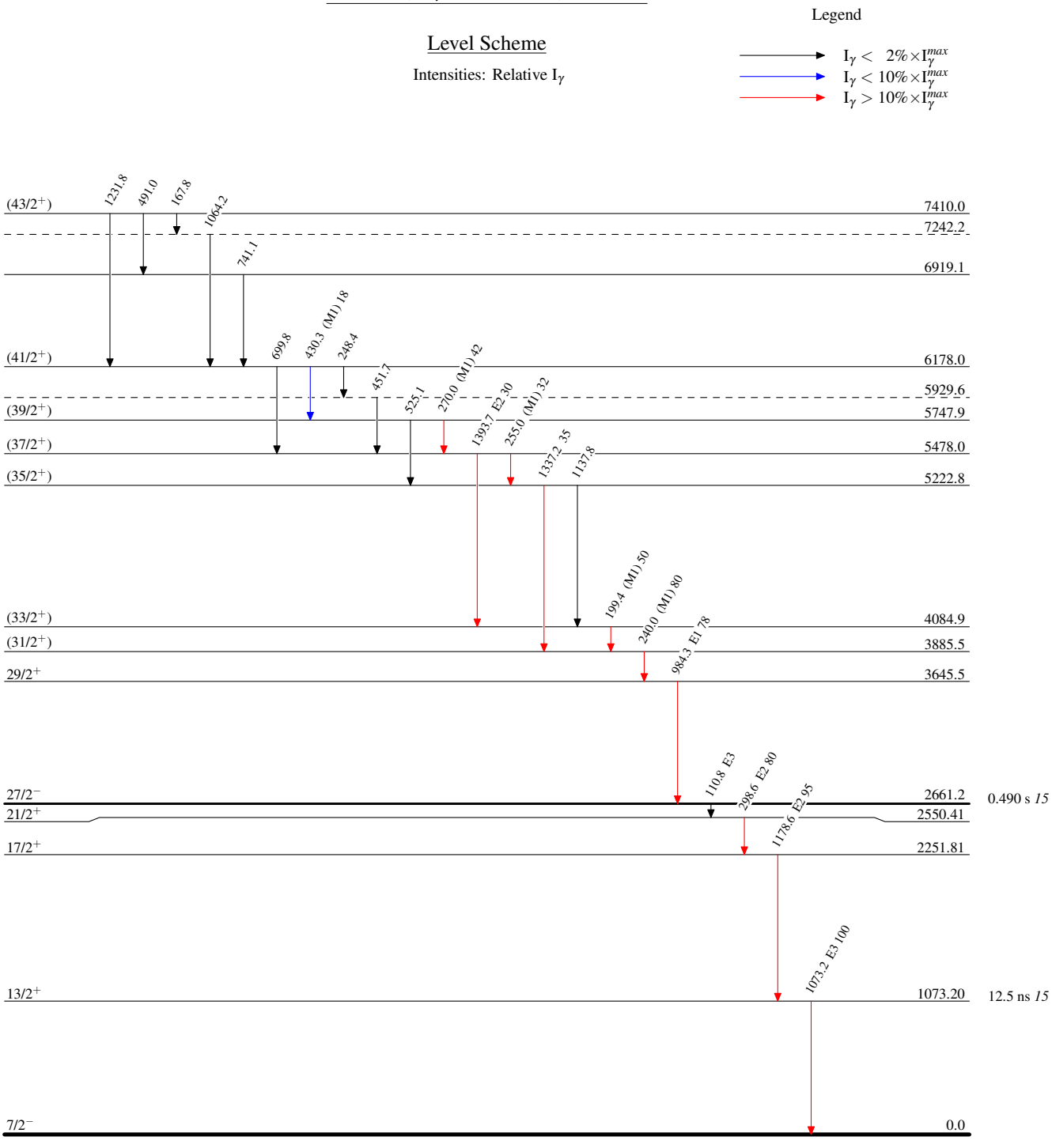
[@] From ce data of 1983JuZY. Details of α(K)exp values are not available.

[&] 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.

^{136}Ce(^{16}O,3nγ) 1980Da18,1983JuZY

Level Scheme

Intensities: Relative I_γ



$^{149}_{66}Dy_{83}$