^{238}U(^{12}C,Fγ) 2012As06

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 154, 1 (2018)	20-Nov-2018

Dataset based on unevaluated XUNDL file compiled by E. Thiagalingam and B. Singh (McMaster) from 2012As06.
Two reactions: ^{238}U(^{12}C,Fγ) and ^{208}Pb(^{18}O,Fγ).
^{12}C beam at E=90 MeV provided by the Legnaro XTU Tandem accelerator. Target=47 mg/cm^2 ^{238}U. ^{18}O beam at E=95 MeV provided by the Vivitron accelerator of IReS (Strasbourg). Targets=100 mg/cm^2 ^{208}Pb, 47 mg/cm^2 ^{238}U. Gamma rays were detected by the Euroball array consisting of 15 cluster Ge, 26 clover Ge detectors, and 30 tapered single-crystal Ge detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin. Deduced levels, J, π, configurations.

^{140}Ce Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	E(level)[†]	J$^\pi$[‡]
0.0[@]	0$^+$		3511.9[@] *18*	8$^+$		5693.8 *19*	
1596.0[@] *10*	2$^+$		3713.8[@] *18*	10$^+$	23.1 ns *4*	6304.1 *19*	(15$^-$)
2083.0[@] *15*	4$^+$		4850.6[@] *18*	12$^+$		6797.1 *19*	(16$^-$)
2107.5[@] *18*	6$^+$	7.3 μs *15*	4904.1 *18*	11$^-$		6889.7 *20*	(15,16)
3424.3 *18*	7$^-$		5093.0 *19*	(12$^-$)		7038.7 *19*	(17$^-$)
3476.0 *19*	8$^-$		5101.5 *18*	13$^-$			
3491.8 *18*	9$^-$		5419.5 *19*	(14$^-$)			

[†] From least-squares fit to Eγ data.
[‡] Below 5200 keV adopted by 2012As06 from ^{138}Ba(α,2nγ) dataset (1986En06, 1984En01). Above 5200 keV tentatively assigned by 2012As06 based on the following criteria: (i) Spin values increase with excitation energy, (ii) High-energy (low-energy) transitions likely have an E2 (M1) character, and (iii) Measured branching ratios as well as the existence or the absence of cross-over transitions place some conditions on the multipolarities.
[#] From Adopted Levels.
[@] Band(A): g.s. band.

γ(^{140}Ce)

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$
(15.8[‡])		3491.8	9$^-$	3476.0	8$^-$	592.3 *5*	4 *2*	5693.8		5101.5	13$^-$
(24.5[‡])		2107.5	6$^+$	2083.0	4$^+$	734.6 *5*	4 *2*	7038.7	(17$^-$)	6304.1	(15$^-$)
52 *1*		3476.0	8$^-$	3424.3	7$^-$	1136.8 *3*	51 *8*	4850.6	12$^+$	3713.8	10$^+$
188.9 *5*	4 *2*	5093.0	(12$^-$)	4904.1	11$^-$	1190.3 *4*	8.8 *25*	4904.1	11$^-$	3713.8	10$^+$
202.0 *3*	28 *6*	3713.8	10$^+$	3511.9	8$^+$	1202.6 *3*	13 *3*	6304.1	(15$^-$)	5101.5	13$^-$
222.0 *3*	52 *8*	3713.8	10$^+$	3491.8	9$^-$	1316.8 *3*	51 *8*	3424.3	7$^-$	2107.5	6$^+$
250.9 *3*	33 *7*	5101.5	13$^-$	4850.6	12$^+$	1384.2 *3*	14 *4*	3491.8	9$^-$	2107.5	6$^+$
318.0 *4*	5.8 *17*	5419.5	(14$^-$)	5101.5	13$^-$	1404.4 *3*	35 *8*	3511.9	8$^+$	2107.5	6$^+$
487 *1*	[†]	2083.0	4$^+$	1596.0	2$^+$	1470.2 *7*	4.3 *17*	6889.7	(15,16)	5419.5	(14$^-$)
493.0 *4*	6.4 *20*	6797.1	(16$^-$)	6304.1	(15$^-$)	1596 *1*	[†]	1596.0	2$^+$	0.0	0$^+$

[†] Transition having a very weak intensity in this experiment because of the long half-life of the 2107.5, 6$^+$ state.
[‡] Inferred from $\gamma\gamma$ coin data (1986En06, (α,2nγ)).

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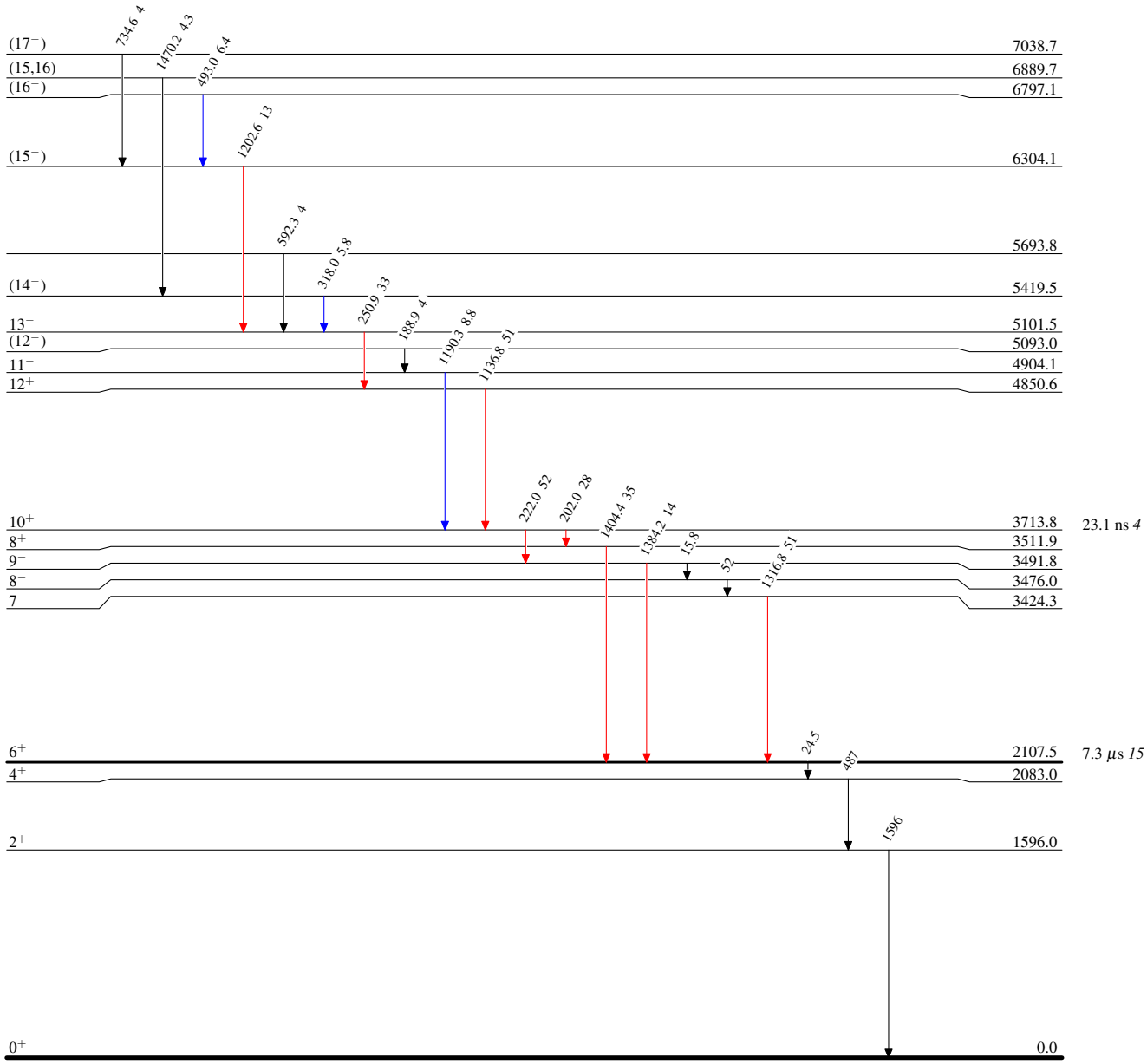
Level Scheme

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)



$^{140}_{58}Ce_{82}$

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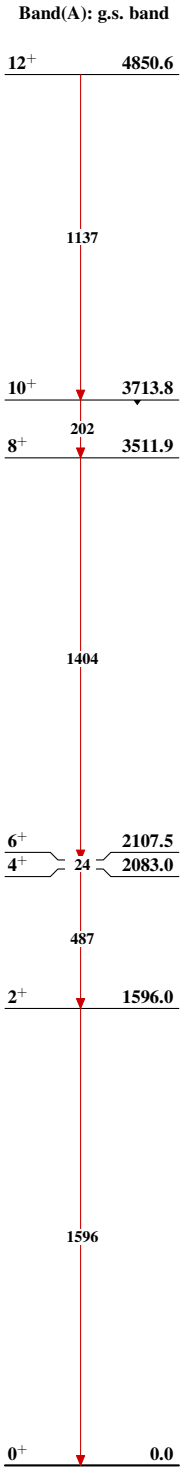

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