^{238}U(^{12}C,Fγ) 2012As06

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	P. K. Joshi, B. Singh, S. Singh, A. K. Jain	NDS 138, 1 (2016)	15-Oct-2016

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. The ^{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, isomer $T_{1/2}$. Deduced levels, J, π, configurations, B(E2).

^{139}La Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0.0[@]	7/2$^+$[#]		
165.6[&] *3*	5/2$^+$[#]		
1380.8[&] *4*	(9/2$^+$)		
1419.9 *4*	11/2$^-$		
1537.1[@] *3*	(11/2$^+$)		
1711.1[&] *3*	(13/2$^+$)		
1799.9[&] *5*	(17/2$^+$)	315 ns *35*	$T_{1/2}$: measured by 2012As06 from (fragment)γ(t) distribution.
1962.2 *4*	(13/2$^+$)		
2032.2[@] *4*	(15/2$^+$)		
2885.4[@] *6*	(19/2$^+$)		
2917.5 *6*	(17/2$^+$)		
3060.7 *6*	(19/2$^-$)		
3149.8 *6*	(19/2$^+$)		
3174.8 *6*	(21/2$^+$)		
3183.8[@] *6*	(23/2$^+$)		
3247.4 *6*	(21/2$^-$)		
3305.1 *6*	(23/2$^-$)		
3364.0 *6*	(21/2$^+$)		
4115.6 *7*	(25/2$^+$)		
4251.8[a] *7*	(23/2$^+$)		
4627.4 *8*	(27/2$^-$)		
4640.7[a] *7*	(25/2$^+$)		
4790.7 *9*			
5217.1[a] *8*	(27/2$^+$)		

[†] From least-squares fit to Eγ data.

[‡] From the branching ratios and existence of cross-over transitions. The assignments for the lowest two levels are known.

[#] From Adopted Levels.

[@] Band(A): γ cascade based on g.s.

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

[a] Band(C): Band based on (23/2$^+$).

^{238}U(^{12}C,Fγ) 2012As06 (continued)

γ(^{139}La)

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.	α[#]	$I_{(\gamma+ce)}$[‡]	Comments
165.6	5/2$^+$	165.6 *3*		0.0	7/2$^+$				
1380.8	(9/2$^+$)	1215.2 *5*	95 *9*	165.6	5/2$^+$	[E2]		95 *9*	
		1380.9 *6*	5 *2*	0.0	7/2$^+$	[M1+E2]		5 *2*	
1419.9	11/2$^-$	1420.0 *5*		0.0	7/2$^+$	[M2]			
1537.1	(11/2$^+$)	1537.0 *4*		0.0	7/2$^+$				
1711.1	(13/2$^+$)	174.0 *3*	28 *5*	1537.1	(11/2$^+$)	[M1+E2]	0.26 *3*	35 *6*	
		291.3 *3*	10 *3*	1419.9	11/2$^-$	[E1]	0.01286	10 *3*	
		330.3 *3*	53 *8*	1380.8	(9/2$^+$)	[E2]	0.0347	55 *8*	
1799.9	(17/2$^+$)	88.7 *5*		1711.1	(13/2$^+$)	[E2]	3.05 *8*		
1962.2	(13/2$^+$)	425.2 *3*		1537.1	(11/2$^+$)				
2032.2	(15/2$^+$)	70.0 *3*	3.4 *14*	1962.2	(13/2$^+$)	[M1+E2]	5.1 *21*	20 *4*	
		232.3 *4*	54 *7*	1799.9	(17/2$^+$)	[M1+E2]	0.1060 *24*	60 *8*	
		495.0 *3*	20 *4*	1537.1	(11/2$^+$)	[E2]	0.01060	20 *4*	
2885.4	(19/2$^+$)	853.2 *4*		2032.2	(15/2$^+$)				
2917.5	(17/2$^+$)	1206.3 *5*		1711.1	(13/2$^+$)				
3060.7	(19/2$^-$)	1260.8 *5*		1799.9	(17/2$^+$)				
3149.8	(19/2$^+$)	232.3 *4*		2917.5	(17/2$^+$)				
3174.8	(21/2$^+$)	1374.9 *4*		1799.9	(17/2$^+$)				
3183.8	(23/2$^+$)	(9.0 *8*)	0.24 *11*	3174.8	(21/2$^+$)	[M1]	1.9×10^2 *7*	45 *7*	$I_{(\gamma+ce)}$: inferred from γγ coin data, γ not observed.
		298.4 *3*	52 *8*	2885.4	(19/2$^+$)	[E2]	0.0477	55 *8*	
3247.4	(21/2$^-$)	97.6 *5*	44 *6*	3149.8	(19/2$^+$)	[E1]	0.251 *5*	55 *8*	
		186.7 *4*	37 *6*	3060.7	(19/2$^-$)	[M1+E2]	0.207 *19*	45 *7*	
3305.1	(23/2$^-$)	(57.7 *8*)	11.1 *16*	3247.4	(21/2$^-$)	[M1]	5.29 *24*	70 *9*	$I_{(\gamma+ce)}$: inferred from γγ coin data, γ not observed.
		130.3 *3*	27 *5*	3174.8	(21/2$^+$)	[E1]	0.1131 *18*	30 *5*	
3364.0	(21/2$^+$)	478.6 *4*		2885.4	(19/2$^+$)				
4115.6	(25/2$^+$)	940.9 *4*		3174.8	(21/2$^+$)				
4251.8	(23/2$^+$)	887.8 *4*	14 *3*	3364.0	(21/2$^+$)	[M1+E2]		14 *3*	
		1068.0 *4*	86 *9*	3183.8	(23/2$^+$)	[M1+E2]		86 *9*	
4627.4	(27/2$^-$)	512 *1*	10 *3*	4115.6	(25/2$^+$)	[E1]		10 *3*	
		1322.3 *5*	90 *9*	3305.1	(23/2$^-$)	[E2]		90 *9*	
4640.7	(25/2$^+$)	388.9 *3*		4251.8	(23/2$^+$)				
4790.7		1485.6 *6*		3305.1	(23/2$^-$)				
5217.1	(27/2$^+$)	576.4 *4*		4640.7	(25/2$^+$)				

[†] Deduced by the evaluators from I(γ+ce) in 2012As06 and α(theory) for multipolarities assumed from Δ(J^π).

[‡] From 2012As06.

[#] 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.

$^{139}_{57}La_{82}$-2

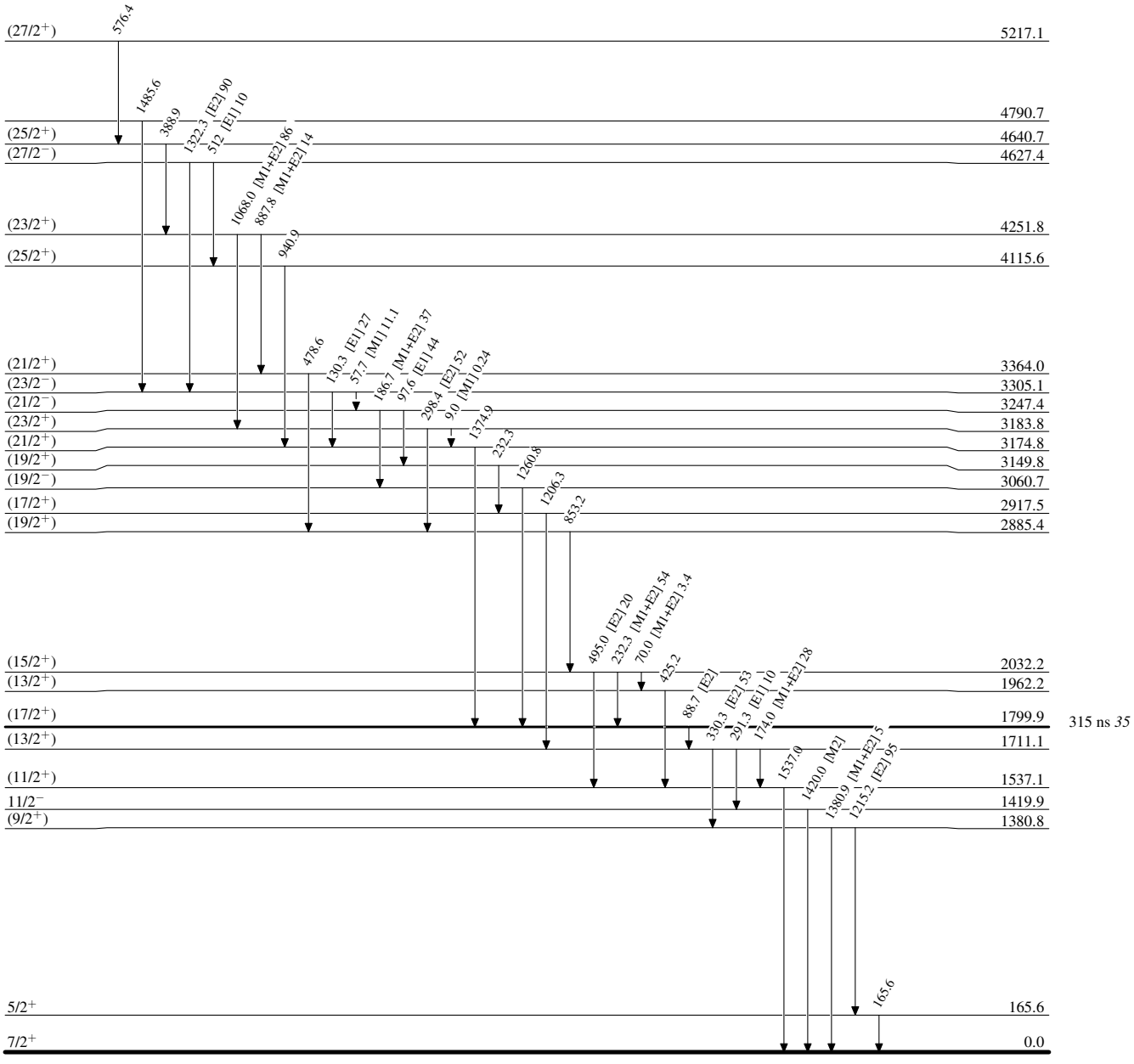
$^{238}U(^{12}C,F\gamma)$ **2012As06**

Legend

Level Scheme

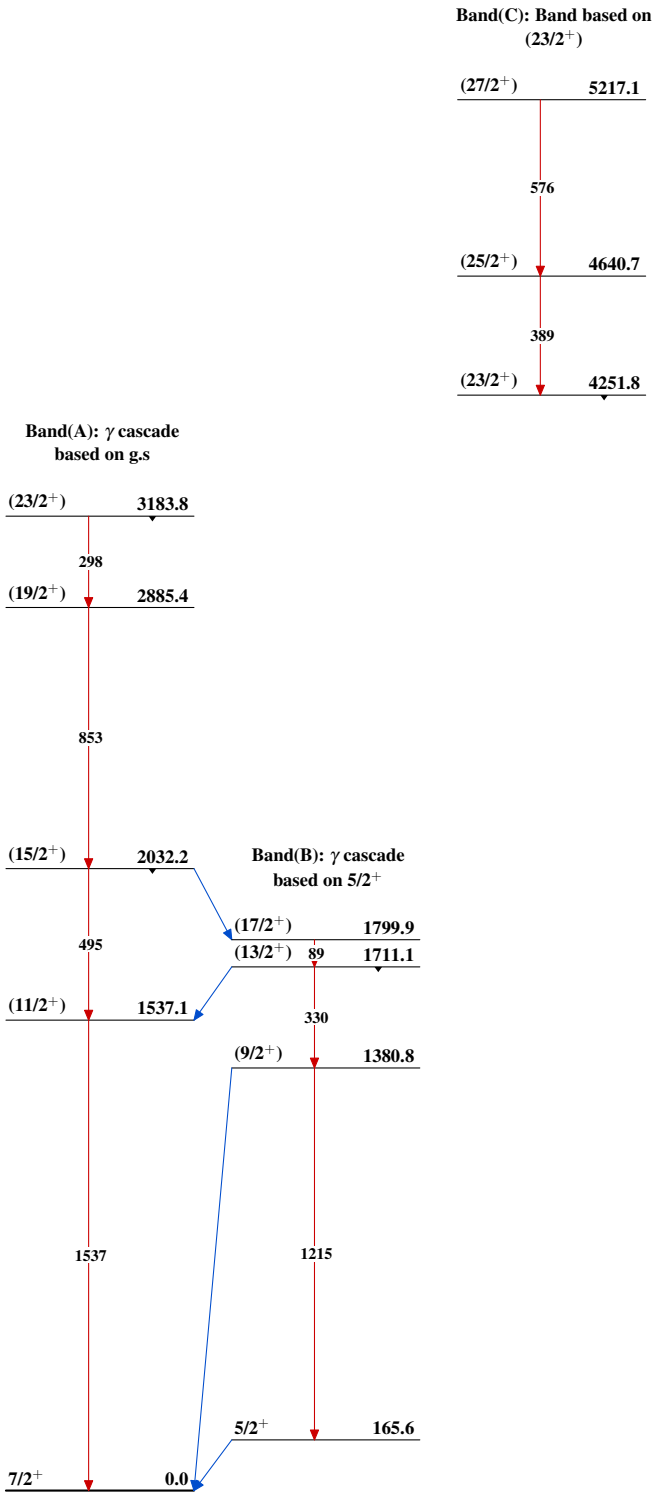
Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{139}_{57}La_{82}$

$^{238}U(^{12}C,F\gamma)$ 2012As06



$^{139}_{57}La_{82}$