^{242}Pu(n,γ):primary γ's 1976Ca25

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja, E. A. Mccutchan	NDS 121, 695 (2014)	30-Sep-2013

E(n)=2.66 eV.

1976Ca25: 288 mg ^{242}Pu target bombarded with 2.66 eV neutrons from Brookhaven high flux beam reactor. Gammas were detected with Ge(Li) detectors (15-40 cm^3 volume). Typical FWHM= 2.2 keV at 1.33 MeV γ. Pileup reduced with a 1.5 mm Pb absorber.

^{243}Pu Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0	7/2$^+$	704.2 *8*	(3/2$^-$)	1130.3 *8*	(1/2$^+$,3/2)	1435.2 *10*	1/2$^+$,3/2
383.3 *8*	(1/2$^+$)	791.2 *8*	(3/2$^-$)	1176.7 *8*	3/2$^+$,5/2$^+$	1491.2 *8*	1/2$^-$,3/2$^-$
392.3 *8*	(3/2$^+$)	809.2 *10*	1/2$^+$,3/2	1301.2 *15*	1/2,3/2	1516.8 *8*	(3/2$^-$)
446.8 *8*	(5/2$^+$)	813.6 *8*	3/2$^+$	1367.8 *8*	1/2,3/2	(5034.2 *26*)	1/2$^+$
653.0 *8*	(3/2$^+$)	905.6 *8*	(1/2$^-$)	1387.4 *8*	3/2$^+$		
677.3 *8*	(5/2$^+$)	948.7 *8*	(3/2$^-$)	1420.2 *10*	(3/2$^+$)		

† The 4641.9γ was assumed to feed the level at 392.3 keV.
‡ Adopted values.

γ(^{243}Pu)

Iγ normalization: Intensities normalized to Iγ(381γ) from ^{243}Pu decay =0.58 *6* per 100 β- decays.

E$_\gamma$†	I$_\gamma$‡#	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
3517.4	46.5 *70*	(5034.2)	1/2$^+$	1516.8	(3/2$^-$)	
3543.0	50.4 *76*	(5034.2)	1/2$^+$	1491.2	1/2$^-$,3/2$^-$	
3599	≈47	(5034.2)	1/2$^+$	1435.2	1/2$^+$,3/2	Peak was broad (1976Ca25).
3614	39 *8*	(5034.2)	1/2$^+$	1420.2	(3/2$^+$)	
3646.8	42.3 *64*	(5034.2)	1/2$^+$	1387.4	3/2$^+$	
3666.4	13.0 *20*	(5034.2)	1/2$^+$	1367.8	1/2,3/2	
3733	12 *3*	(5034.2)	1/2$^+$	1301.2	1/2,3/2	
3857.5	2.6 *9*	(5034.2)	1/2$^+$	1176.7	3/2$^+$,5/2$^+$	
3903.9	16.6 *25*	(5034.2)	1/2$^+$	1130.3	(1/2$^+$,3/2)	
4085.5	30.3 *46*	(5034.2)	1/2$^+$	948.7	(3/2$^-$)	
4128.6	24.2 *37*	(5034.2)	1/2$^+$	905.6	(1/2$^-$)	
4220.6	38.3 *58*	(5034.2)	1/2$^+$	813.6	3/2$^+$	
4225.0	20 *4*	(5034.2)	1/2$^+$	809.2	1/2$^+$,3/2	
4243.0	17.8 *27*	(5034.2)	1/2$^+$	791.2	(3/2$^-$)	
4330.0	43.5 *66*	(5034.2)	1/2$^+$	704.2	(3/2$^-$)	
4356.9	6.4 *10*	(5034.2)	1/2$^+$	677.3	(5/2$^+$)	
4381.2	9.1 *14*	(5034.2)	1/2$^+$	653.0	(3/2$^+$)	
4587.4	8.3 *13*	(5034.2)	1/2$^+$	446.8	(5/2$^+$)	
4641.9	8.8 *14*	(5034.2)	1/2$^+$	392.3	(3/2$^+$)	
4650.9	3.1 *6*	(5034.2)	1/2$^+$	383.3	(1/2$^+$)	

† Measurement of 1976Ca25. Uncertainties are about 2-3 keV on absolute energy scale and 0.8 keV on relative energies, except for 3599, 3614, 3733, and 4225 γ's (relative uncertainties are 1.0, 1.0, 1.5, and 1.0 keV, respectively).
‡ From 1976Ca25, given as per 10000 neutron captures. Relative intensities were normalized by the evaluator such that Iγ(381γ) from ^{243}Pu β^- decay= 0.58 *6* per 100 ^{243}Pu decays.
# For intensity per 100 neutron captures, multiply by 0.0083 *9*.

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Level Scheme

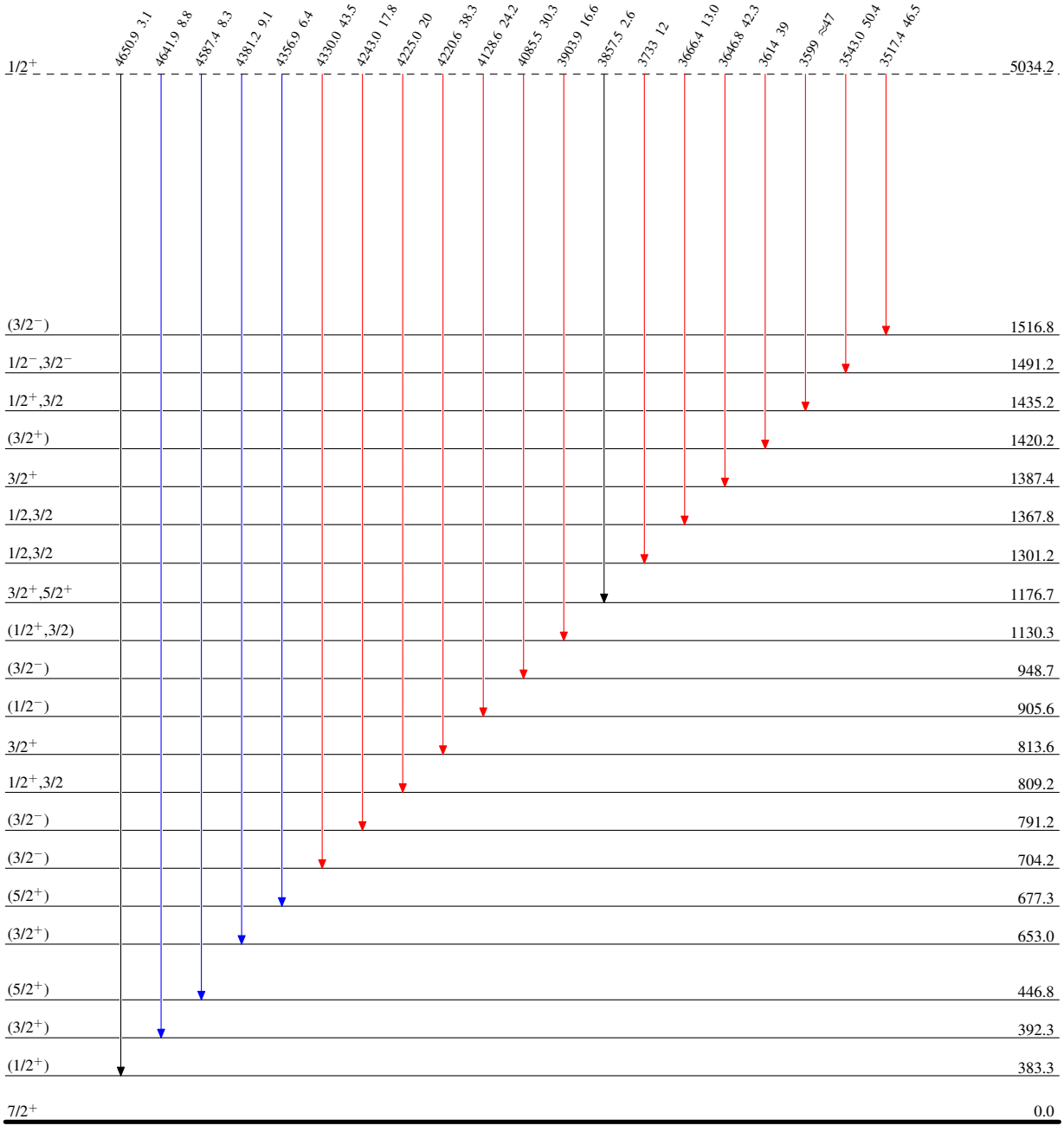
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{243}_{94}Pu_{149}$