^{9}Be(^{136}Xe,Xγ),(^{238}U,X) 2009Ca02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Zoltan Elekes and Janos Timar	NDS 129, 191 (2015)	28-Feb-2015

2009Ca02: E=750 MeV/nucleon ^{136}Xe beam produced at the SIS accelerator complex at GSI. The reaction ^{9}Be(^{238}U,X) with a beam energy of 650 MeV/nucleon was also performed. GSI Fragment Separator operated in achromatic mode with scintillators at intermediate and final foci and 2 ionization chambers. Measured Eγ, Iγ, $\gamma\gamma$ using the RISING array of 15 Ge cluster detectors. Comparisons with large-scale shell-model calculations.

2007Ho22: ^{9}Be(^{136}Xe,xγ) E=120 MeV/nucleon ^{136}Xe beam provided by National Superconducting Cyclotron lab (NSCL) at MSU. Fragmentation of ^{136}Xe beam followed by separation of fragments by A1900 fragment separator. Time-of-flight measured with a plastic scintillator. Measured Eγ, Iγ, delayed γ, (fragment)γ correlated events using segmented germanium (SeGA) array. The Ge detectors were gated for 15 μs by a particle implantation trigger from Si detectors.

^{128}Cd Levels

E(level)[†‡]	J$^\pi$[@]	T$_{1/2}$[#]	Comments
0.0	0$^+$		
645.80 *20*	(2$^+$)		
1430.39 *22*	(4$^+$)		
1870.5 *3*	(5$^-$)	270 ns *7*	T$_{1/2}$: time distribution of several γ rays. Dominant $\pi g_{9/2}^{-1}p_{1/2}^{-1}$ configuration.
2108.3 *4*	(7$^-$)	12 ns *2*	T$_{1/2}$: time distribution of 237.9γ, centroid shift method. Dominant $\nu d_{3/2}^{-1}h_{11/2}^{-1}$ configuration can possibly be traced to $\pi g_{9/2}\nu d_{3/2}$ monopole.
2195.4 *4*	(6$^+$)		
2645.9 *4*	(8$^+$)		Dominant $\nu h_{11/2}^{-2}$ configuration.
2714.6 *4*	(10$^+$)	3.56 μs *6*	Dominant $\nu h_{11/2}^{-2}$ configuration. T$_{1/2}$: time distribution of 69γ, 238γ and 538γ.

[†] From least-squares fit to Eγ's (by evaluators).
[‡] From 2009Ca02. 2007Ho22 reports fewer gamma transitions but they are similar to the those of 2009Ca02.
[#] From 2009Ca02, time distributions of γ rays.
[@] 2007Ho22 suggests two alternative level schemes one of which differs significantly (including 5$^-$, 7$^-$ and 9$^-$ levels analogous to (^{126}Cd) from that of 2009Ca02. However, the placement of γ rays is not based on coincidence data unlike 2009Ca02. Therefore, 2009Ca02 level scheme is adopted.

γ(^{128}Cd)

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	α[†]	Comments
68.7 *1*	5.2 *5*	2714.6	(10$^+$)	2645.9	(8$^+$)	E2	5.69	α(exp)=6.4 *9* α(K)=3.74 *6*; α(L)=1.582 *25*; α(M)=0.317 *5*; α(N)=0.0519 *8*; α(O)=0.000650 *10* α(exp): from $\gamma\gamma$ coincidence data with gate on 238γ. Mult.: from α(exp).
237.9 *5*	39 *2*	2108.3	(7$^-$)	1870.5	(5$^-$)			
440.3 *3*	84 *4*	1870.5	(5$^-$)	1430.39	(4$^+$)			
450.4 *3*	1.8 *3*	2645.9	(8$^+$)	2195.4	(6$^+$)			
537.6 *2*	47 *3*	2645.9	(8$^+$)	2108.3	(7$^-$)			
645.8 *2*	100 *5*	645.80	(2$^+$)	0.0	0$^+$			
765.0 *3*	1.2 *2*	2195.4	(6$^+$)	1430.39	(4$^+$)			
784.6 *1*	90 *5*	1430.39	(4$^+$)	645.80	(2$^+$)			
1224.0 *6*	11 *1*	1870.5	(5$^-$)	645.80	(2$^+$)			

Continued on next page (footnotes at end of table)

^{9}Be(^{136}Xe,Xγ),(^{238}U,X) 2009Ca02 (continued)

γ(^{128}Cd) (continued)

† 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.

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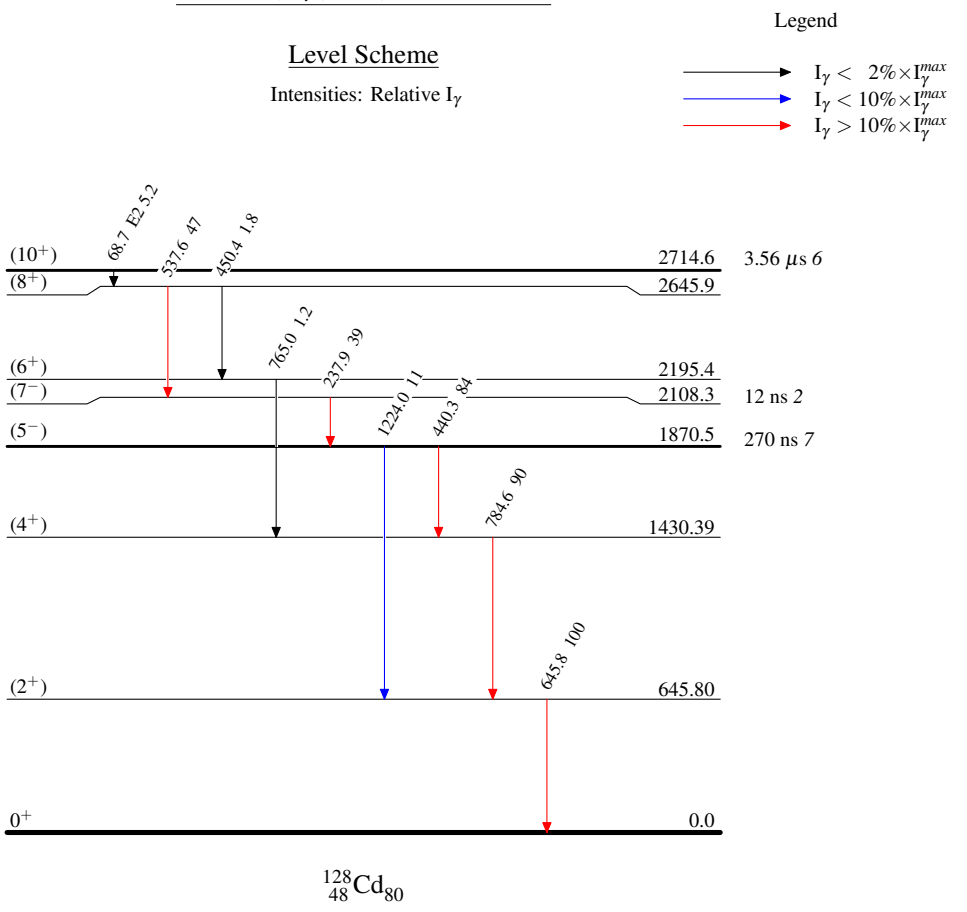
Level Scheme

Intensities: Relative I_γ



$^{128}_{48}Cd_{80}$