^{58}Ni(^{64}Zn,αpnγ) 2006Sm04

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 111, 717 (2010)	1-Dec-2009

E=265 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma(\theta)$ using Gammasphere spectrometer, consisting of 101 (75% efficient) Compton-suppressed Ge detectors. These detectors were arranged in 16 rings, having a constant polar angle θ with respect to the beam axis. Charged particles were detected with the Microball detector array consisting of 95 CsI(I(γ+ce)) scintillators. Reaction products separated with the fragment mass analyzer (FMA).

^{116}Cs Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0+x		1076.3+x# *2*	(12$^+$)	3462.8+x# *5*	(18$^+$)	6463.7+x# *7*	(24$^+$)
191.8+x *1*		1318.6+x@ *6*	(13$^+$)	3601.0+x@ *7*	(19$^+$)	6583.8+x@ *8*	(25$^+$)
416.9+x# *2*	(8$^+$)	1726.3+x# *2*	(14$^+$)	4481.5+x# *6*	(20$^+$)	7533.1+x# *8*	(26$^+$)
457+x		1953.4+x@ *7*	(15$^+$)	4543.3+x@ *7*	(21$^+$)	7751.6+x@ *9*	(27$^+$)
633.1+x# *2*	(10$^+$)	2537.3+x# *3*	(16$^+$)	5480.0+x# *6*	(22$^+$)	9016.3+x@ *10*	(29$^+$)
875.8+x@ *7*	(11$^+$)	2727.9+x@ *7*	(17$^+$)	5530.0+x@ *7*	(23$^+$)	10381.4+x@ *11*	(31$^+$)

† From least-squares fit to Eγ's.
‡ As proposed by 2006Sm04 based on angular distribution data, long cascades of stretched quadrupole transitions and systematics of neighboring Cs nuclides.
# Band(A): $\nu h_{11/2}\otimes\pi h_{11/2}$, α=0.
@ Band(a): $\nu h_{11/2}\otimes\pi h_{11/2}$, α=1.

γ(^{116}Cs)

Angular intensity ratio (R) taken from γ ray intensities at $\theta\approx90°$ (28 detectors at θ=79.2°, 80.7°, 90.0°, 99.3°, and 100.8°) and $\theta\approx40°$ (38 detectors at θ=31.7°, 37.4°, 50.1°, 129.9°, 142.6°, and 148.3°). This ratio is ≈ 1.3 for ΔJ=2, stretched quadrupole and ≈0.8 for ΔJ=1, stretched dipole.

E$_\gamma$†	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.#	Comments
176& *1*	5 *1*	633.1+x	(10$^+$)	457+x			R=1.82 *14*.
189& *1*	8 *1*	2727.9+x	(17$^+$)	2537.3+x	(16$^+$)		
191.8 *1*	100 *5*	191.8+x		0+x			Mult.: stretched Q suggested by R=1.27 *4*.
216.2 *1*	64 *3*	633.1+x	(10$^+$)	416.9+x	(8$^+$)	E2	R=1.19 *4*.
225.1 *1*	79 *4*	416.9+x	(8$^+$)	191.8+x			Mult.: stretched Q or unstretched mixed D+Q. R=1.59 *6*.
226 *1*	10 *2*	1953.4+x	(15$^+$)	1726.3+x	(14$^+$)	M1+E2	R=0.72 *8*.
243@ *1*	32@ *4*	875.8+x	(11$^+$)	633.1+x	(10$^+$)	M1+E2	R=0.77 *2* for doublet.
243@ *1*	32@ *4*	1318.6+x	(13$^+$)	1076.3+x	(12$^+$)	M1+E2	R=0.77 *2* for doublet.
442& *1*	10 *3*	633.1+x	(10$^+$)	191.8+x			
442.8 *1*	56‡ *6*	1318.6+x	(13$^+$)	875.8+x	(11$^+$)	E2	R=1.42 *5* for 443.2+442.8.
443.2 *1*	56‡ *6*	1076.3+x	(12$^+$)	633.1+x	(10$^+$)	E2	R=1.42 *5* for 443.2+442.8.
634.8 *1*	24 *2*	1953.4+x	(15$^+$)	1318.6+x	(13$^+$)	E2	R=1.37 *5*.
650.0 *1*	20 *2*	1726.3+x	(14$^+$)	1076.3+x	(12$^+$)	E2	R=1.24 *5*.
774.5 *1*	21 *2*	2727.9+x	(17$^+$)	1953.4+x	(15$^+$)	E2	R=1.40 *5*.
811.0 *2*	11 *1*	2537.3+x	(16$^+$)	1726.3+x	(14$^+$)	E2	R=1.60 *7*.
873.1 *1*	21 *2*	3601.0+x	(19$^+$)	2727.9+x	(17$^+$)	E2	R=1.45 *6*.

Continued on next page (footnotes at end of table)

^{58}Ni(^{64}Zn,αpnγ) 2006Sm04 (continued)

γ(^{116}Cs) (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	Comments
925.5 *4*	9 *1*	3462.8+x	(18$^+$)	2537.3+x	(16$^+$)	E2	R=1.31 *6*.
942.3 *1*	20 *2*	4543.3+x	(21$^+$)	3601.0+x	(19$^+$)	E2	R=1.30 *5*.
983.7 *4*	6 *1*	6463.7+x	(24$^+$)	5480.0+x	(22$^+$)		
986.7 *2*	13 *1*	5530.0+x	(23$^+$)	4543.3+x	(21$^+$)	E2	R=1.33 *6*.
998.5 *2*	10 *3*	5480.0+x	(22$^+$)	4481.5+x	(20$^+$)	E2	R=1.46 *8*.
1018.7 *2*	10 *3*	4481.5+x	(20$^+$)	3462.8+x	(18$^+$)	E2	R=1.65 *10*.
1053.8 *4*	8 *3*	6583.8+x	(25$^+$)	5530.0+x	(23$^+$)		
1069.4[&] *4*	2 *1*	7533.1+x	(26$^+$)	6463.7+x	(24$^+$)		
1167.8 *4*	5 *2*	7751.6+x	(27$^+$)	6583.8+x	(25$^+$)		
1264.7[&] *4*	3 *1*	9016.3+x	(29$^+$)	7751.6+x	(27$^+$)		
1365.1[&] *4*	3 *1*	10381.4+x	(31$^+$)	9016.3+x	(29$^+$)		

[†] Uncertainties assigned as 0.1 for I$\gamma\geq$20, 0.2 for Iγ=10-19, 0.4 for Iγ<10 and 1 keV when Eγ stated to nearest keV, based on a general comment by 2006Sm04 that uncertainties are 0.1-0.4 keV.

[‡] Combined for 442.8+443.2.

[#] 2006Sm04 assigned E2 to all the ΔJ=2 transitions and M1/E2 to ΔJ=1 transitions, except 176γ, 216.2γ and 442γ. The evaluator has assigned the multipolarities for those transitions where R_{ang} data are available. Since the angular distribution data are parity insensitive, mult=E2 is assigned to ΔJ=2, quadrupole transitions and M1+E2 to ΔJ=1 transitions.

[@] Multiply placed with undivided intensity.

[&] Placement of transition in the level scheme is uncertain.

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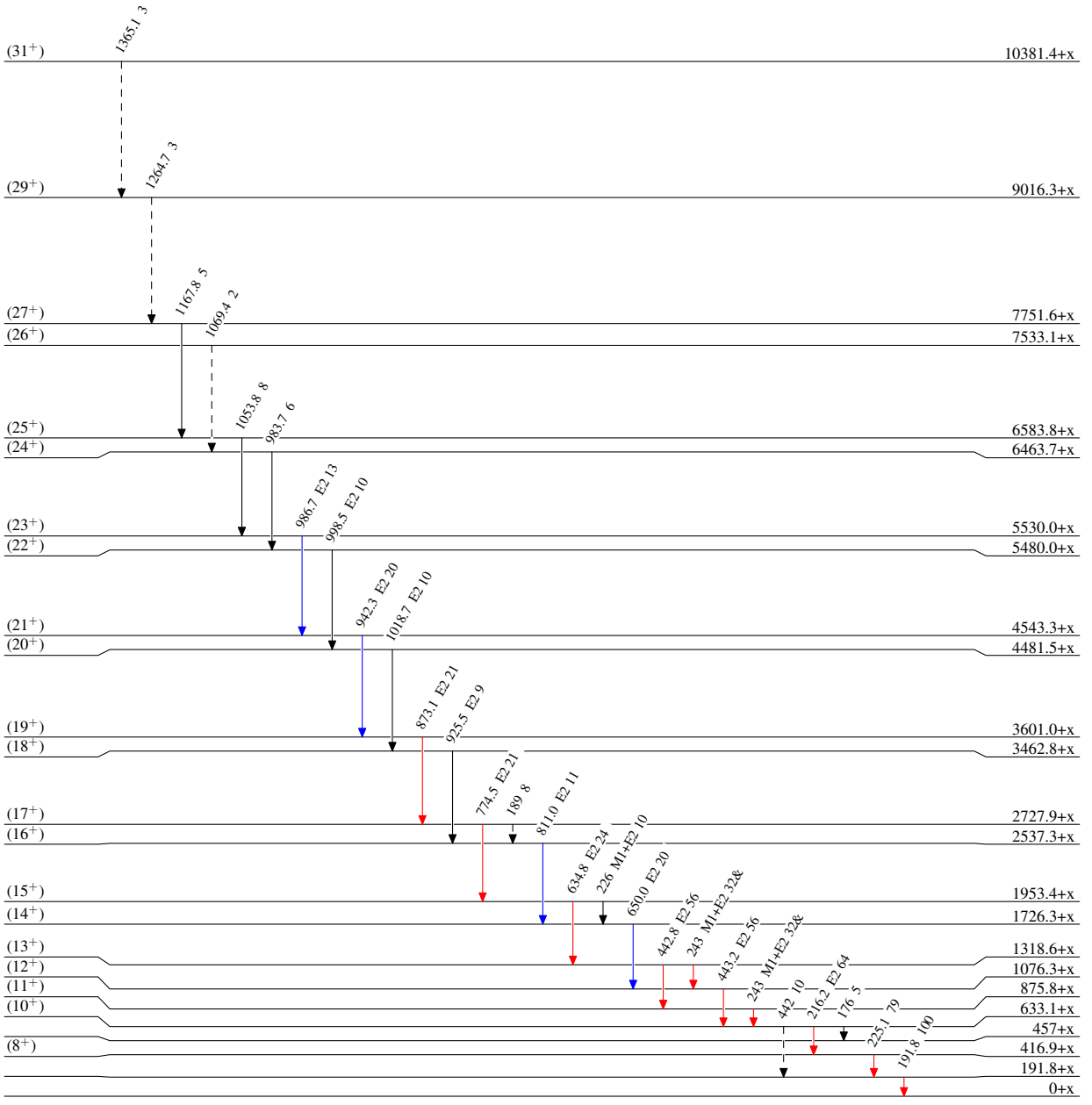
Level Scheme

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

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)



$^{116}_{55}Cs_{61}$

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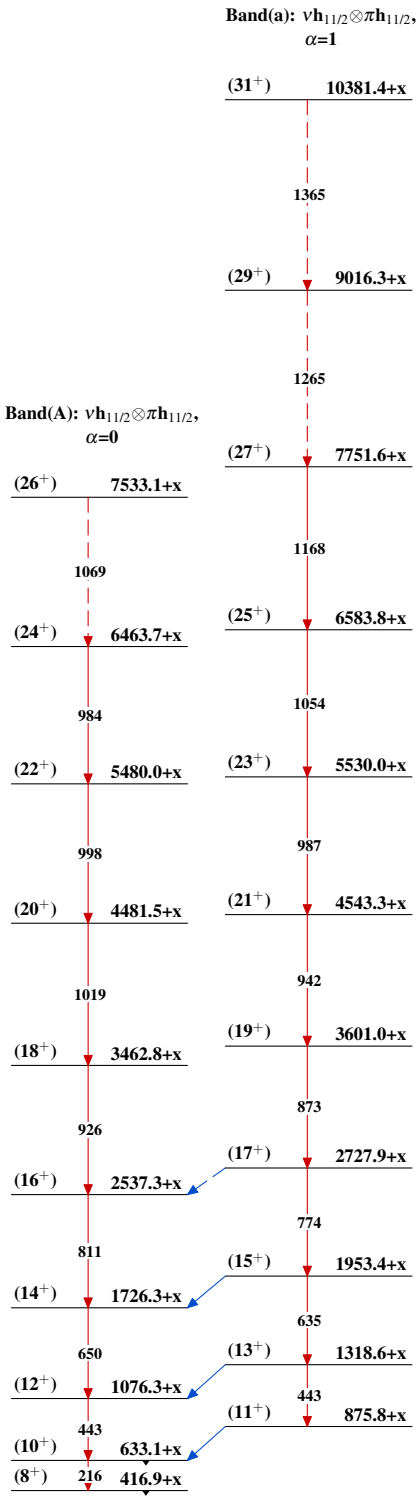

$^{116}_{55}Cs_{61}$