^{112}Cd(p,nγ) 1988Ki04,1976Io04,1980Ad04

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. Lalkovski, F. G. Kondev	NDS 124, 157 (2015)	1-Aug-2014

1988Ki04: Facility: Jyvaskyla cyclotron; E(p)=4.8 MeV; Target: 1.6 mg/cm^2; Detectors: two Ge(Li), one Si(Li), superconducting solenoid magnet; Measured: Eγ at θ=125° with respect to the beam axis, Iγ, Ice, E(ce); Deduced: ^{112}In level scheme, α(K)exp, α(L)exp, J^π, α, γ-ray Mult.; Also from the same collaboration: 1987KiZX, 1986TiZZ.

1976Io04, 1976Io05: Facility: Bucharest Tandem accelerator and cyclotron; Beam: E(p)=5.7-11 MeV; Target: Isotopically enriched in ^{112}Cd; Detectors: NaI(Tl), Ge(Li), Si(Li); Measured: Eγ, Iγ(θ,H,t), γ(t), γ-γ(t); Deduced: ^{112}In level scheme, J^π, mult, g-factor, $T_{1/2}$.

1983Ko12, 1980Ad04: Facility: Tokyo Institute of Technology, 4 MV Van de Graaff; Beam: E(p)=3.75-4.75 MeV; Target: self-supported targets, 1.9 mg/cm^2 and 1.2 mg/cm^2 enriched to 97% in ^{112}Cd; Detectors: LEPS, two Ge(Li), Compton polarimeter, consisting of two HPGe detectors; Measured: γ, γ-γ coinc., γ-γ(θ), Eγ, Iγ; Deduced: ^{112}In level scheme, J^π, Q(p,n), linear polarization (P_{exp}), DCO coeff. A_2 and A_4, δ, $T_{1/2}$.

Others: 1979EmZX, 1978EmZT, 1978SaZM, 1973FrYM, 1972BrYL.

^{112}In Levels

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	Comments
0.0[@]	1+	14.88 min *15*	$T_{1/2}$: From Adopted Levels.
156.56 *6*	4+	20.67 min *8*	$T_{1/2}$: From Adopted Levels. configuration: $\pi(1g_{9/2})^{-1}\otimes\nu(3s_{1/2})^{+1}$.
162.91 *7*	(5)+		
206.70[@] *4*	2+		
350.84 *10*	7+	0.69 μs *5*	E(level): 343.3 in 1976Io04. Jπ: 6+ in 1976Io04. g: +0.675 *6* from DPAD in 1976Io04.
456.44[@] *4*	3+		
562.73 *8*	5+		
592.11[@] *7*	4+		
594.89[&] *5*	2+		
613.78[a] *13*	(8)−	2.81 μs *3*	E(level): 606.0 in 1976Io04. $T_{1/2}$: 2.81 μs *6* in 1976Io05. g: +0.385 *4* from DPAD in 1976Io04.
624.45[a] *11*	7(−)		
676.32[a] *11*	(6)−		
728.95 *5*	(1)−,2−		Jπ: 1+,2 in 1983Ko12.
729.83 *5*	3+		configuration: $\pi(1g_{9/2})^{-1}\otimes\nu(2d_{3/2})^{+1}$.
795.27[@] *11*	5+		Jπ: 5(−) in 1983Ko12.
822.30[a] *11*	(5−)		
883.71[&] *6*	3+		
918.83 *5*	(2)−		Jπ: 1−,2+ in 1983Ko12.
924.65 *5*	(3)−		
928.65 *6*	(0)−		
1007.44[a] *11*	(4−)		
1037.78 *8*	(0)−		
1062.87 *5*	1+,(2)+		Jπ: 1−,2+ in 1983Ko12.
1150.34 *9*	≥3		
1212.15 *10*	≤4−		
1212.23 *6*	≤3		
1221.61 *9*	(3,4)+		
1250.85 *7*	(2,3)+		
1260.40 *9*	≤3−		
1261.47 *7*	≤4+		

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^{112}Cd(p,nγ) 1988Ki04,1976Io04,1980Ad04 (continued)

^{112}In Levels (continued)

E(level)[†]	J$^{\pi}$[‡]
1279.67 *4*	(1,2,3)$^{+}$
1286.29 *7*	≤3^{-}
1286.93[a] *13*	(3^{-})

[†] From a least-squares fit to Eγ.
[‡] From 1988Ki04, unless otherwise noted.
[#] From 1976Io04, unless otherwise noted.
[@] Member of the $\pi(1g_{9/2})^{-1}\otimes\nu(1g_{7/2})^{+1}$ split multiplet.
[&] Member of the $\pi(1g_{9/2})^{-1}\otimes\nu(2d_{5/2})^{+1}$ split multiplet.
[a] Member of the $\pi(1g_{9/2})^{-1}\otimes\nu(1h_{11/2})^{+1}$ split multiplet.

γ(^{112}In)

E$_{\gamma}$[†]	I$_{\gamma}$[†]	E$_i$(level)	J$^{\pi}_i$	E$_f$	J$^{\pi}_f$	Mult.[‡]	δ[#]	Comments
(6.30[@] *5*)	100	162.91	(5)$^{+}$	156.56	4^{+}			
51.87[@] *3*	0.94 *12*	676.32	(6)$^{-}$	624.45	7$^{(-)}$			
[x]99.69 *8*	0.35 *6*							
135.63 *8*	4.3 *1*	592.11	4^{+}	456.44	3^{+}	M1		Mult.: α(K)exp=0.20 *4* (1988Ki04). Mult.: A$_2$=−0.287 *52*; A$_4$=0.005 *66* (1983Ko12). Mult.: possible E2 admixture with δ= −0.01 *10* (1983Ko12).
138.37 *8*	0.36 *3*	594.89	2^{+}	456.44	3^{+}			
[x]142.81 *8*	0.34 *3*							
145.99 *8*	2.95 *10*	822.30	(5^{-})	676.32	(6)$^{-}$	M1		
149.46 *8*	0.37 *3*	1212.23	≤3	1062.87	1^{+},(2)$^{+}$			
156.57 *8*	4.2 *2*	156.56	4^{+}	0.0	1^{+}	M3		Mult.: α(K)exp=5.4 *5*; α(L)exp=1.36 *12* (1988Ki04).
185.15 *8*	2.4 *1*	1007.44	(4^{-})	822.30	(5^{-})	M1		Mult.: α(K)exp=0.07 *1* (1988Ki04).
187.95 *8*	3.3 *2*	350.84	7^{+}	162.91	(5)$^{+}$	E2		Mult.: α(K)exp=0.11 *1* (1988Ki04). I(187.8γ)/I(262.7γ)=1.32 *4* (1976Io04). 187.8γ decays to 162-keV level and not to 155.5-keV level as stated by 1976Io04.
189.86 *8*	1.8 *1*	918.83	(2)$^{-}$	728.95	(1)$^{-}$,2^{-}			
195.73 *8*	4.0 *2*	924.65	(3)$^{-}$	728.95	(1)$^{-}$,2^{-}	M1		Mult.: α(K)exp=0.073 *6* (1988Ki04).
199.73 *8*	0.14 *4*	928.65	(0)$^{-}$	728.95	(1)$^{-}$,2^{-}			
203.16 *8*	0.89 *5*	795.27	5^{+}	592.11	4^{+}	M1(+E2)	+0.01 *11*	Mult.: A$_2$=−0.238 *69*; A$_4$=0.033 *91* (1983Ko12).
206.71 *8*	100 *4*	206.70	2^{+}	0.0	1^{+}	M1		Mult.: α(K)exp=0.072 *6*; α(L)exp=0.0075 *6*; α(M)exp= 0.0013 *1* (1988Ki04). Mult.: A$_2$=−0.130 *4*; A$_4$=0.022 *6* (1983Ko12). δ: possible E2 admixture with δ= −0.03 *12* or −0.05 *5* (1983Ko12).
214.18 *8*	0.56 *4*	1221.61	(3,4)$^{+}$	1007.44	(4^{-})			
223.51 *8*	1.40 *8*	1286.29	≤3^{-}	1062.87	1^{+},(2)$^{+}$	E1		Mult.: α(K)exp=0.019 *5* (1988Ki04).
249.67 *8*	25.2 *4*	456.44	3^{+}	206.70	2^{+}	M1		Mult.: α(K)exp=0.041 *3*;

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$^{112}Cd(p,n\gamma)$ 1988Ki04,1976Io04,1980Ad04 (continued)

$\gamma(^{112}In)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[#]	Comments
								α(L)exp=0.0054 *10*; α(M)exp= 0.0013 *3* (1988Ki04). Mult.: A_2=−0.203 *9*; A_4=−0.007 *11* (1983Ko12).
262.94 *8*	2.8 *1*	613.78	$(8)^-$	350.84	7^+	E1+M2	+0.09 *4*	Mult.: α(K)exp=0.014 *3* (1988Ki04). δ: from PAC data in 1987Iw04.
273.49 *8*	1.16 *6*	729.83	3^+	456.44	3^+			
273.62 *8*	1.16 *6*	624.45	$7^{(-)}$	350.84	7^+			
279.49 *8*	0.78 *4*	1286.93	(3^-)	1007.44	(4^-)	M1		Mult.: from the adopted gammas.
283.56 *8*	0.37 *4*	1212.23	≤3	928.65	$(0)^-$			
287.54 *8*	1.56 *6*	1212.23	≤3	924.65	$(3)^-$			
288.81 *8*	6.3 *2*	883.71	3^+	594.89	2^+	M1+E2	+0.05 *3*	Mult.: α(K)exp=0.024 *5* (1988Ki04). Mult.: A_2=−0.171 *14*; A_4=0.006 *18* (1983Ko12). Mult.: P_{exp}=−0.35 *6* (1983Ko12).
291.5 *2*	0.2 *1*	883.71	3^+	592.11	4^+			
293.32 *8*	2.4 *1*	1212.15	$\leq4^-$	918.83	$(2)^-$	E2,M1		Mult.: α(K)exp=0.030 *5* (1988Ki04).
323.87 *8*	8.2 *4*	918.83	$(2)^-$	594.89	2^+	E1		Mult.: α(K)exp=0.006 *2* (1988Ki04).
326.15 *8*	2.0 *1*	1250.85	$(2,3)^+$	924.65	$(3)^-$	E1		Mult.: α(K)exp≤0.012 (1988Ki04).
333.11 *8*	0.92 *6*	1062.87	$1^+,(2)^+$	729.83	3^+			
367.37 *8*	1.12 *6*	1286.29	$\leq3^-$	918.83	$(2)^-$			
385.5 *2*	0.16 *5*	592.11	4^+	206.70	2^+			
388.16 *8*	11.4 *4*	594.89	2^+	206.70	2^+	M1		Mult.: α(K)exp=0.0127 *12* (1988Ki04). Mult.: A_2=0.156 *25*, A_4=−0.020 *30* (1983Ko12) or A_2=0.134 *10*, A_4=0.006 *13* (1983Ko12). Mult.: possible E2 admixture with δ=−0.03 *12* or −0.05 *5* (1983Ko12).
399.84 *8*	0.60 *5*	562.73	5^+	162.91	$(5)^+$	M1,E2		
406.15 *8*	1.29 *6*	562.73	5^+	156.56	4^+	M1,E2		
421.39 *8*	0.52 *5*	1150.34	≥3	728.95	$(1)^-,2^-$			
427.29 *8*	0.65 *6*	883.71	3^+	456.44	3^+			
429.2 *1*	0.5 *1*	592.11	4^+	162.91	$(5)^+$			
456.45 *8*	0.39 *7*	456.44	3^+	0.0	1^+			
468.15 *8*	0.85 *6*	924.65	$(3)^-$	456.44	3^+			
483.25 *8*	1.04 *7*	1212.23	≤3	728.95	$(1)^-,2^-$			
521.94 *8*	11.3 *9*	1250.85	$(2,3)^+$	728.95	$(1)^-,2^-$			
522.29 *8*	11.3 *9*	728.95	$(1)^-,2^-$	206.70	2^+			
523.13 *8*	6.1 *3*	729.83	3^+	206.70	2^+			
531.45 *8*	1.2 *2*	1260.40	$\leq3^-$	728.95	$(1)^-,2^-$	M1,E2		Mult.: α(K)exp=0.006 *2*.
573.25 *8*	63 *6*	729.83	3^+	156.56	4^+	M1+E2	+0.10 *5*	Mult.: α(K)exp=0.0039 *15* (1988Ki04). Mult.: A_2=−0.154 *19*; A_4=0.056 *25* (1983Ko12). Mult.: P_{exp}=−0.10 *10* (1983Ko12).
594.87 *8*	37.4 *17*	594.89	2^+	0.0	1^+	M1+E2	+0.10 *3*	Mult.: α(K)exp=0.0045 *4* (1988Ki04). Mult.: A_2=−0.082 *11*, A_4=0.032 *14* (1983Ko12) or A_2=−0.069 *5*, A_4=0.042 *6* (1983Ko12). Mult.: P_{exp}=−0.19 *4* (1983Ko12). δ: Also: 0.09 (1983Ko12).
666.5 *1*	0.47 *7*	1261.47	$\leq4^+$	594.89	2^+			
717.90 *8*	7.8 *3*	924.65	$(3)^-$	206.70	2^+	E1		Mult.: α(K)exp=0.009 *1* (1988Ki04). Mult.: A_2=0.159 *19*; A_4=0.009 *25* (1983Ko12). Mult.: P_{exp}=−0.24 *11* (1983Ko12).
727.16 *8*	4.0 *2*	883.71	3^+	156.56	4^+			
728.96 *8*	28.1 *10*	728.95	$(1)^-,2^-$	0.0	1^+	E1+M2	+0.13 +5−7	Mult.: α(K)exp=0.00099 *15* (1988Ki04).

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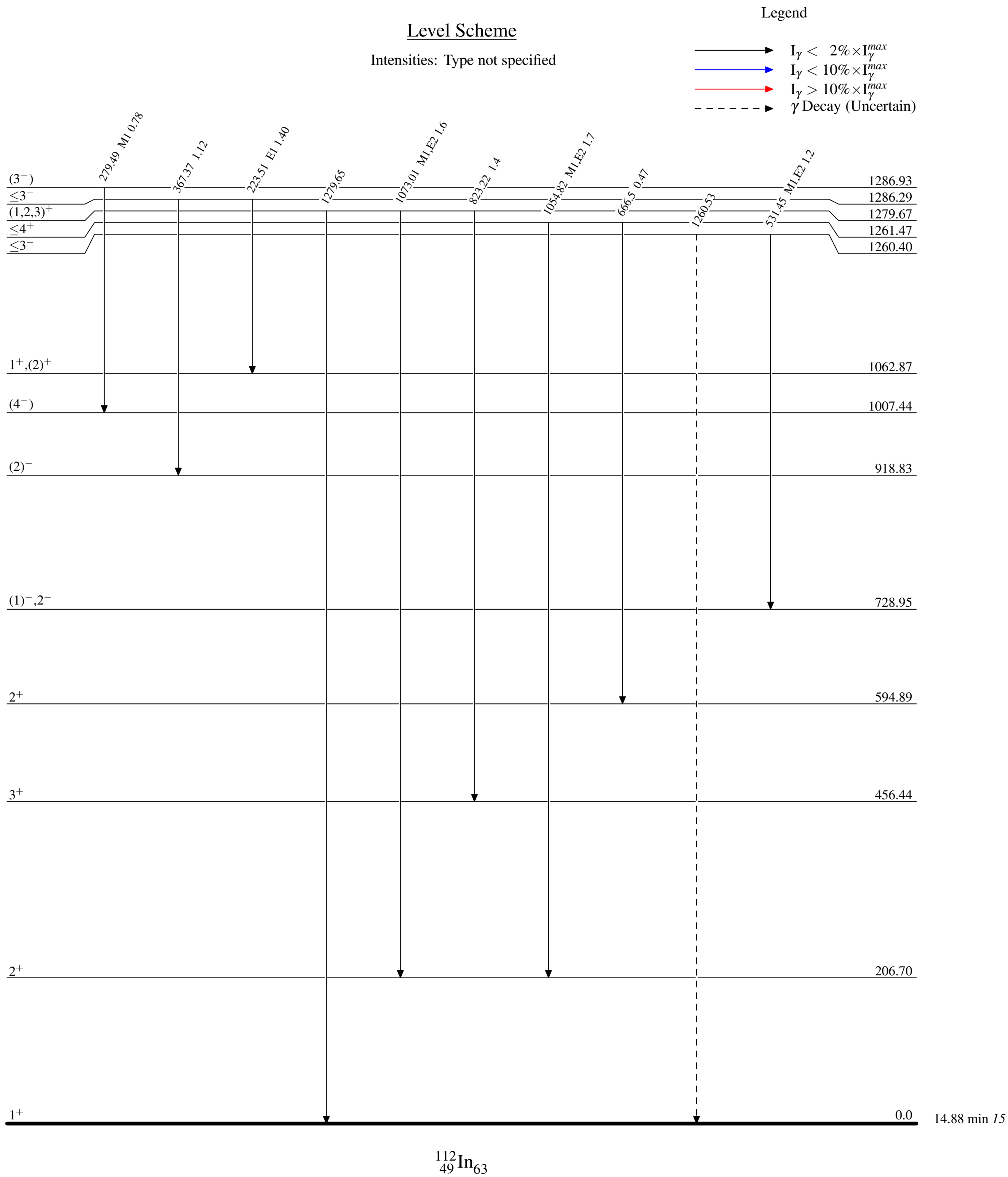
^{112}Cd(p,nγ) 1988Ki04,1976Io04,1980Ad04 (continued)

γ(^{112}In) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡	δ #	Comments
								Mult.: A_2=−0.092 *18*, A_4=0.004 *23* (1983Ko12) or A_2=−0.079 *7*, A_4=0.010 *9* (1983Ko12). Mult.: P_{exp}=0.21 *7* (1983Ko12); Also: 0.11 *3* (1983Ko12). δ: Also: 0.11 *2* (1983Ko12).
765.15 *8*	1.6 *1*	1221.61	$(3,4)^+$	456.44	3^+	M1		Mult.: from the adopted gammas.
^{x}774.5 *1*	0.34 *6*							
823.22 *8*	1.4 *2*	1279.67	$(1,2,3)^+$	456.44	3^+			
856.21 *8*	3.6 *2*	1062.87	$1^+,(2)^+$	206.70	2^+	M1		Mult.: α(K)exp=0.002 *4* (1988Ki04). Mult.: A_2=0.148 *67*, A_4=−0.062 *82* (1983Ko12); Possible E2 admixture with δ=0.0 *−3+95* (1983Ko12).
918.81 *8*	7.7 *2*	918.83	$(2)^-$	0.0	1^+	E1		Mult.: α(K)exp=0.00063 *7* (1988Ki04). Mult.: A_2=0.086 *20*; A_4=0.029 *27* (1983Ko12). Mult.: P_{exp}=−0.20 *10* (1983Ko12). Mult.: possible M2 admixture with δ=0.00 *12* (1983Ko12).
928.59 *8*	7.1 *2*	928.65	$(0)^-$	0.0	1^+	E1		Mult.: α(K)exp=0.00057 *6* (1988Ki04). Mult.: A_2=0.016 *18*; A_4=0.028 *24* (1983Ko12). Mult.: P_{exp}=−0.21 *9* (1983Ko12).
1037.77 *8*	5.9 *2*	1037.78	$(0)^-$	0.0	1^+	E1		Mult.: α(K)exp=0.00044 *6* (1988Ki04).
1054.82 *8*	1.7 *1*	1261.47	≤4^+	206.70	2^+	M1,E2		Mult.: α(K)exp=0.0010 *2* (1988Ki04).
1062.94 *8*	20.4 *8*	1062.87	$1^+,(2)^+$	0.0	1^+	M1+E2	+0.16 *5*	Mult.: α(K)exp=0.00088 *12* (1988Ki04). Mult.: A_2=−0.036 *14*; A_4=0.023 *19* (1983Ko12). Mult.: P_{exp}=−0.32 *7* (1983Ko12).
1073.01 *8*	1.6 *1*	1279.67	$(1,2,3)^+$	206.70	2^+	M1,E2		Mult.: α(K)exp=0.0011 *2* (1988Ki04).
^{x}1131.7 *1*	2.3 *3*							
^{x}1138.62 *8*	1.1 *2*							
^{x}1191.31 *8*	1.1 *2*							
1260.53& *5*		1260.40	≤3^-	0.0	1^+			E_γ: from 1983Ko12. Not observed by 1988Ki04.
1279.65 *5*		1279.67	$(1,2,3)^+$	0.0	1^+			E_γ: from 1983Ko12. Not observed by 1988Ki04.

† From 1988Ki04, unless otherwise noted.
‡ Based on α(K)exp in 1988Ki04 and A_2, and A_4 in 1980Ko12.
# From 1983Ko12, unless otherwise noted. Note: Rose and Brink phase conversion (PC) was used by the authors. Here, δ correspond to the Steffen's PC, according to the ENSDF policy.
@ From the adopted gammas.
& Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

^{112}Cd(p,nγ) **1988Ki04,1976Io04,1980Ad04**



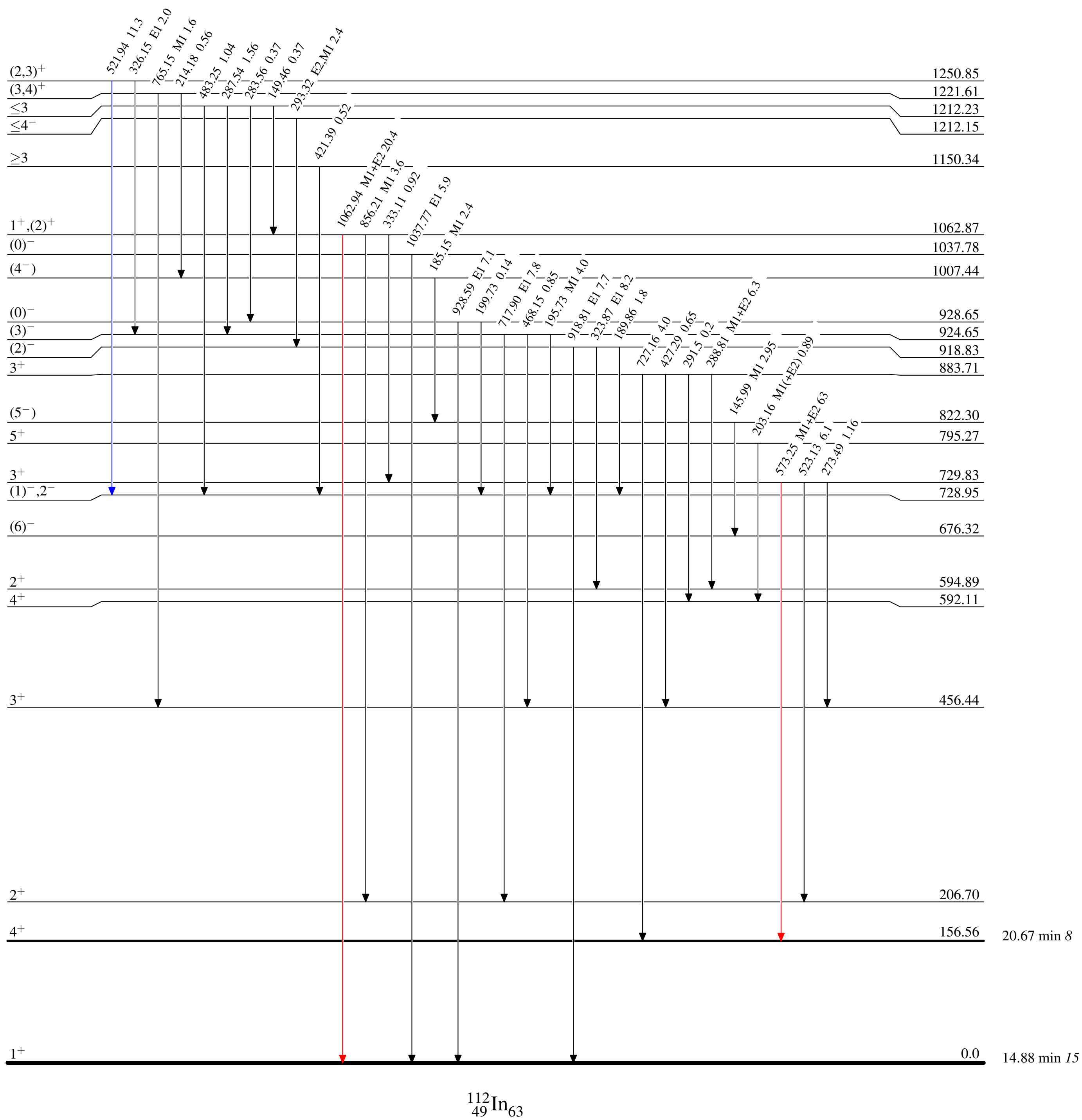
$^{112}Cd(p,n\gamma)$ 1988Ki04,1976Io04,1980Ad04

Level Scheme (continued)

Intensities: Type not specified

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$



^{112}Cd(p,nγ) 1988Ki04,1976Io04,1980Ad04

Legend

Level Scheme (continued)

Intensities: Type not specified