^{92}Zr(^{90}Zr,2nγ) 2000Ko48

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 126, 151 (2015)	1-Feb-2015

^{92}Zr(^{90}Zr,2nγ), E=380 MeV. Includes: ^{91}Zr(^{90}Zr,nγ) at 380 MeV and ^{90}Zr(^{90}Zr,γ) at 369 MeV. Measured Eγ, Iγ, $\gamma\gamma$, and $\gamma(\theta)$ using Gammasphere array consisting of 101 Compton-suppressed HPGe detectors. Channel selection performed with recoil-decay tagging technique using Fragment Mass Analyzer with a PPAC and DSSD at the focal plane. Measured Eα, $T_{1/2}$, recoil-γ-γ and α-γ-γ coincidences.

α: Additional information 1.

^{180}Hg Levels

E(level)[†]	J^{π}[‡]	$T_{1/2}$	Comments
0.0[#]	0^+	2.59 s *2*	$T_{1/2}$: from recoil-α(t).
434.30[#] *10*	2^+		
706.70[#] *14*	4^+		
797.2 *6*	(2^+)		E(level): the relative order of the 602γ-797γ cascade is reversed in ^{180}Tl ε decay (1.09 s), giving a level at 602. The evaluator adopts the ε decay ordering since Iγ(602γ)>Iγ(797γ) in that decay. The ^{92}Zr(^{90}Zr,2nγ) Iγ data are consistent with this order.
1032.70[#] *17*	6^+		
1175.7 *8*			
1399.5 *5*	(3^-)		
1437.22[#] *20*	8^+		
1504.8 *4*	6^+		
1797.8[@] *3*	5^-		
1869.8 *4*	(6^-)		
1914.02[#] *22*	10^+		
2042.2[@] *4*	7^-		
2057.4 *5*	(6^+)		
2069.3[&] *5*	(6^-)		
2323.4 *6*	8^+		
2359.4[@] *4*	9^-		
2369.3 *9*	(8^-)		
2372.1[&] *5*	(8^-)		
2456.32[#] *25*	12^+		
2524.0 *7*	(8^+)		
2741.9[&] *7*	(10^-)		
2749.1[@] *5*	11^-		
3041.2 *11*	(10^+)		
3055.7[#] *4*	14^+		
3162.2[&] *8*	(12^-)		
3199.9[@] *5*	13^-		
3617.1[&] *9*	(14^-)		
3688.9[@] *7*	15^-		
3704.5[#] *5*	16^+		
4107.1[&] *12*	(16^-)		
4195.0[@] *8*	17^-		
4388.5[#] *7*	18^+		
4628.0?[&] *14*	(18^-)		
4734.2[@] *11*	(19^-)		

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^{92}Zr(^{90}Zr,2nγ) 2000Ko48 (continued)

^{180}Hg Levels (continued)

E(level)†	J$^{\pi}$‡
5091.5# *11*	(20^{+})
5309.9?@ *14*	(21^{-})
5803.4?# *13*	(22^{+})

† From a least-squares fit to Eγ′s by evaluator.
‡ As proposed by 2000Ko48 based on γ(θ) measurements, decay patterns and comparisons of population intensities.
# Band(A): g.s. band.
@ Band(B): 5^{-} band.
& Band(C): (6^{-}) band.

γ(^{180}Hg)

R=angular anisotropy ratio, derived from several angles (see 2000Ko48 for details). R>1 suggests ΔJ=2, stretched quadrupole or ΔJ=1, M1+E2 with positive δ. R<1 suggests ΔJ=1, dipole or ΔJ=1, M1+E2 with negative δ.

E$_{\gamma}$†	I$_{\gamma}$‡	E$_i$(level)	J$^{\pi}_i$	E$_f$	J$^{\pi}_f$	Mult.#	α	Comments
244.4 *2*	10.7 *5*	2042.2	7^{-}	1797.8	5^{-}	E2	0.201	Mult.: A$_2$=+0.31 *13*; R=1.39 *25*.
272.4 *1*	72.5 *24*	706.70	4^{+}	434.30	2^{+}	E2	0.1426	Mult.: A$_2$=+0.24 *6*, A$_4$=−0.12 *8*; R=1.30 *6*.
302.4 *4*	2.4 *4*	2372.1	(8^{-})	2069.3	(6^{-})	E2	0.1040	Mult.: R=1.3 *4*.
317.2 *2*	15.4 *7*	2359.4	9^{-}	2042.2	7^{-}	E2	0.0903	Mult.: A$_2$=+0.36 *9*.
326.0 *1*	67.5 *22*	1032.70	6^{+}	706.70	4^{+}	E2	0.0835	Mult.: A$_2$=+0.29 *6*, A$_4$=−0.09 *6*; R=1.28 *6*.
369.8 *4*	8.1 *6*	2741.9	(10^{-})	2372.1	(8^{-})	E2	0.0586	Mult.: A$_2$=+0.54 *20*; R=1.2 *3*.
389.7 *2*	12.0 *6*	2749.1	11^{-}	2359.4	9^{-}	E2	0.0508	Mult.: A$_2$=+0.30 *11*; R=1.26 *13*.
398.4 *4*	2.5 *5*	1797.8	5^{-}	1399.5	(3^{-})	E2	0.0479	Mult.: R=1.1 *5*.
404.5 *1*	50.3 *17*	1437.22	8^{+}	1032.70	6^{+}	E2	0.0460	Mult.: A$_2$=+0.33 *7*, A$_4$=−0.03 *10*; R=1.34 *8*.
420.3 *4*	5.6 *5*	3162.2	(12^{-})	2741.9	(10^{-})	E2	0.0416	Mult.: R=1.2 *3*.
434.3 *1*	100 *3*	434.30	2^{+}	0.0	0^{+}	E2	0.0383	Mult.: A$_2$=+0.28 *6*, A$_4$=−0.06 *8*; R=1.22 *5*.
450.8 *2*	10.1 *5*	3199.9	13^{-}	2749.1	11^{-}	E2	0.0348	Mult.: A$_2$=+0.53 *20*; R=1.33 *22*.
454.9 *4*	3.4 *4*	3617.1	(14^{-})	3162.2	(12^{-})	E2	0.0340	Mult.: R=1.3 *3*.
466.4 *8*	2.0 *7*	2524.0	(8^{+})	2057.4	(6^{+})			
476.8 *1*	28.2 *12*	1914.02	10^{+}	1437.22	8^{+}	E2	0.0303	Mult.: A$_2$=+0.46 *12*, A$_4$=−0.03 *16*; R=1.33 *15*.
489.0 *4*	5.0 *7*	3688.9	15^{-}	3199.9	13^{-}	E2	0.0284	Mult.: R=1.6 *5*.
490.0 *8*	1.3 *3*	4107.1	(16^{-})	3617.1	(14^{-})			
499.5 *8*	1.3 *4*	2369.3	(8^{-})	1869.8	(6^{-})			
502.6 *4*	2.9 *5*	2372.1	(8^{-})	1869.8	(6^{-})			
506.1 *4*	3.2 *6*	4195.0	17^{-}	3688.9	15^{-}	E2	0.0262	Mult.: R=1.5 *5*.
517.2 *8*	1.9 *3*	3041.2	(10^{+})	2524.0	(8^{+})			
520.9@ *8*	<1.0	4628.0?	(18^{-})	4107.1	(16^{-})			
539.2 *8*	1.8 *5*	4734.2	(19^{-})	4195.0	17^{-}			
542.3 *1*	21.5 *10*	2456.32	12^{+}	1914.02	10^{+}	E2	0.0222	Mult.: A$_2$=+0.37 *17*, A$_4$=+0.03 *22*; R=1.72 *23*.
563.6 *8*	1.5 *4*	2069.3	(6^{-})	1504.8	6^{+}			
575.7@ *8*	<1.0	5309.9?	(21^{-})	4734.2	(19^{-})			
599.4 *2*	13.5 *8*	3055.7	14^{+}	2456.32	12^{+}	E2	0.01762	Mult.: A$_2$=+0.43 *19*; R=1.10 *25*.
602.3 *8*	<2.0	1399.5	(3^{-})	797.2	(2^{+})			
604.7 *4*	8.7 *7*	2042.2	7^{-}	1437.22	8^{+}	D		Mult.: A$_2$=−0.6 *3*; R=0.54 *17*.
610.2 *8*	1.5 *3*	2524.0	(8^{+})	1914.02	10^{+}			
620.1 *4*	5.0 *5*	2057.4	(6^{+})	1437.22	8^{+}	E2	0.01633	Mult.: A$_2$=+0.50 *11*; R=1.29 *16*.
648.8 *4*	8.1 *5*	3704.5	16^{+}	3055.7	14^{+}	E2	0.01477	Mult.: R=1.28 *21*.

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^{92}Zr(^{90}Zr,2nγ) 2000Ko48 (continued)

γ(^{180}Hg) (continued)

Eγ[†]	Iγ[‡]	Ei(level)	J^π_i	Ef	J^π_f	Mult.[#]	α	Comments
684.0 *4*	3.1 *4*	4388.5	18+	3704.5	16+	E2	0.01316	Mult.: R=1.21 *25*.
692.9 *8*	<2.0	1399.5	(3−)	706.70	4+			
703.0 *8*	1.0 *2*	5091.5	(20+)	4388.5	18+			
711.9[@] *8*	<0.8	5803.4?	(22+)	5091.5	(20+)			
741.4 *8*	<1.0	1175.7		434.30	2+			
765.2 *8*	1.7 *4*	1797.8	5−	1032.70	6+	D		Mult.: R=0.65 *19*.
797.3 *8*	<2.0	797.2	(2+)	0.0	0+			
797.9 *4*	3.9 *5*	1504.8	6+	706.70	4+	E2	0.00950 *14*	Mult.: R=1.11 *13*.
818.6 *4*	2.1 *6*	2323.4	8+	1504.8	6+	E2	0.00902 *13*	Mult.: R=1.37 *22*.
837.5 *4*	2.8 *4*	1869.8	(6−)	1032.70	6+	(D)		Mult.: R=1.13 *19*.
934.0[@] *8*	<1.0	2372.1	(8−)	1437.22	8+			
1010[@] *1*	<3.0	2042.2	7−	1032.70	6+			
1036.0 *8*	1.8 *4*	2069.3	(6−)	1032.70	6+	(D)		Mult.: R=1.9 *3*.
1091.3 *4*	4.6 *5*	1797.8	5−	706.70	4+	D		Mult.: R=0.73 *14*.

[†] ΔEγ=0.1 keV for Iγ>20, 0.2 keV for 10<Iγ<20, 0.4 keV for 2<Iγ<10, and 0.8 keV for Iγ<2, based on a general statement by 2000Ko48.

[‡] Intensity relative to Iγ(434γ)=100.

[#] From angular distribution coefficients and/or angular anisotropy ratios. Stretched Q transitions are assumed to be E2.

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

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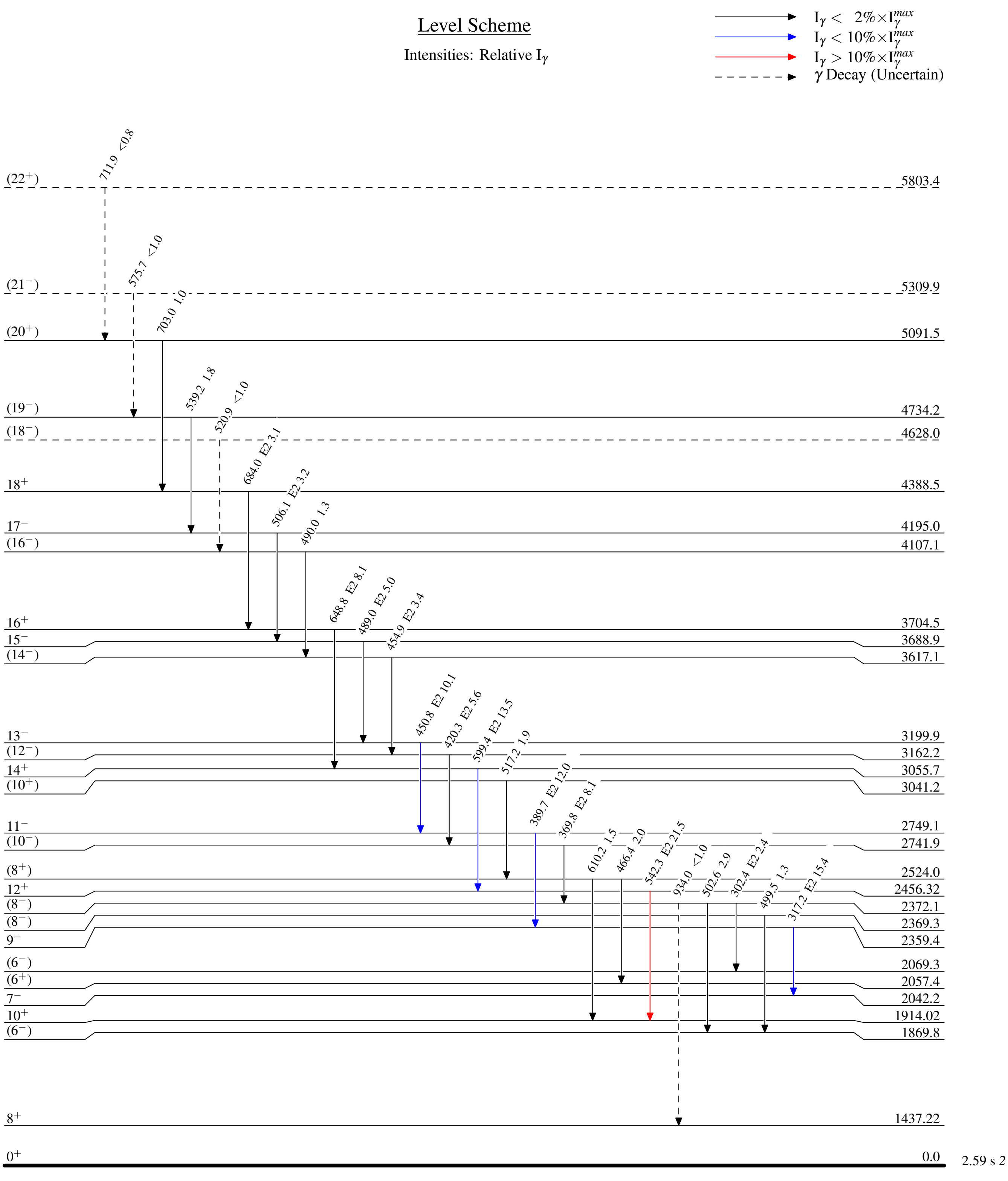
Level Scheme

Intensities: Relative I_γ

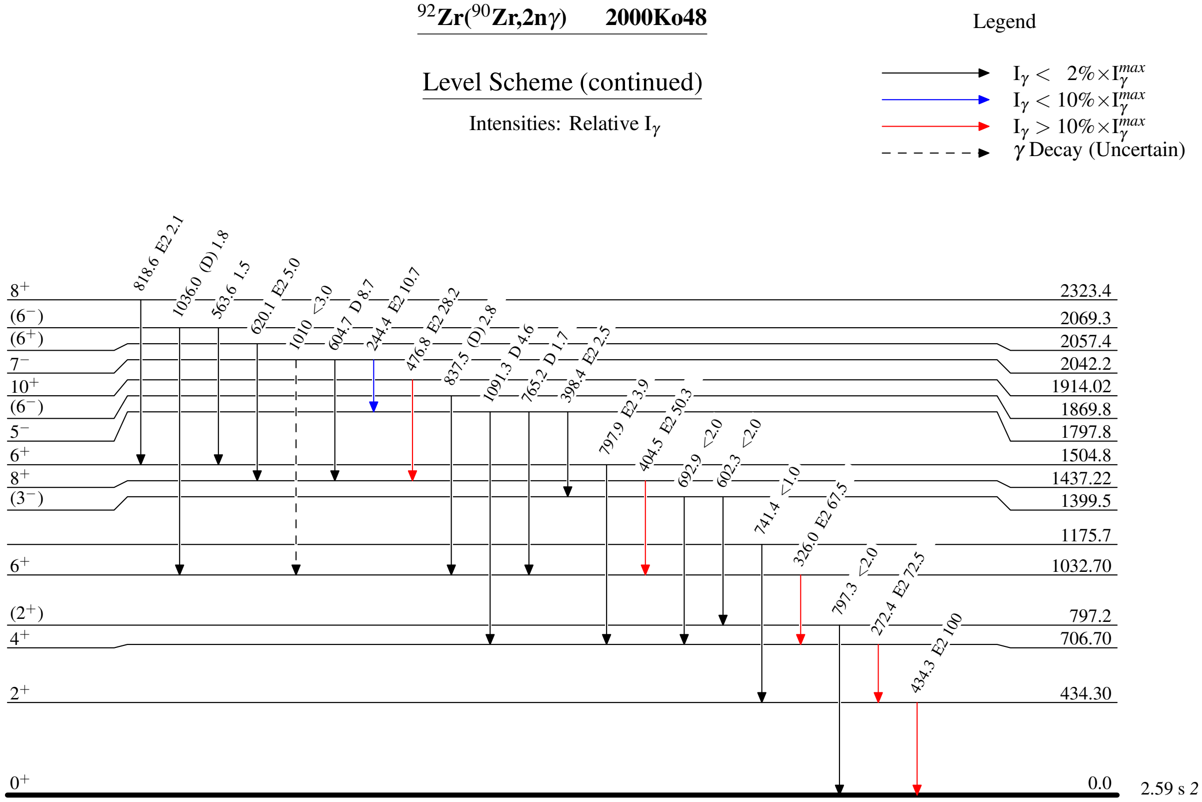


$^{180}_{80}$Hg$_{100}$

$^{92}Zr(^{90}Zr,2n\gamma)$ 2000Ko48

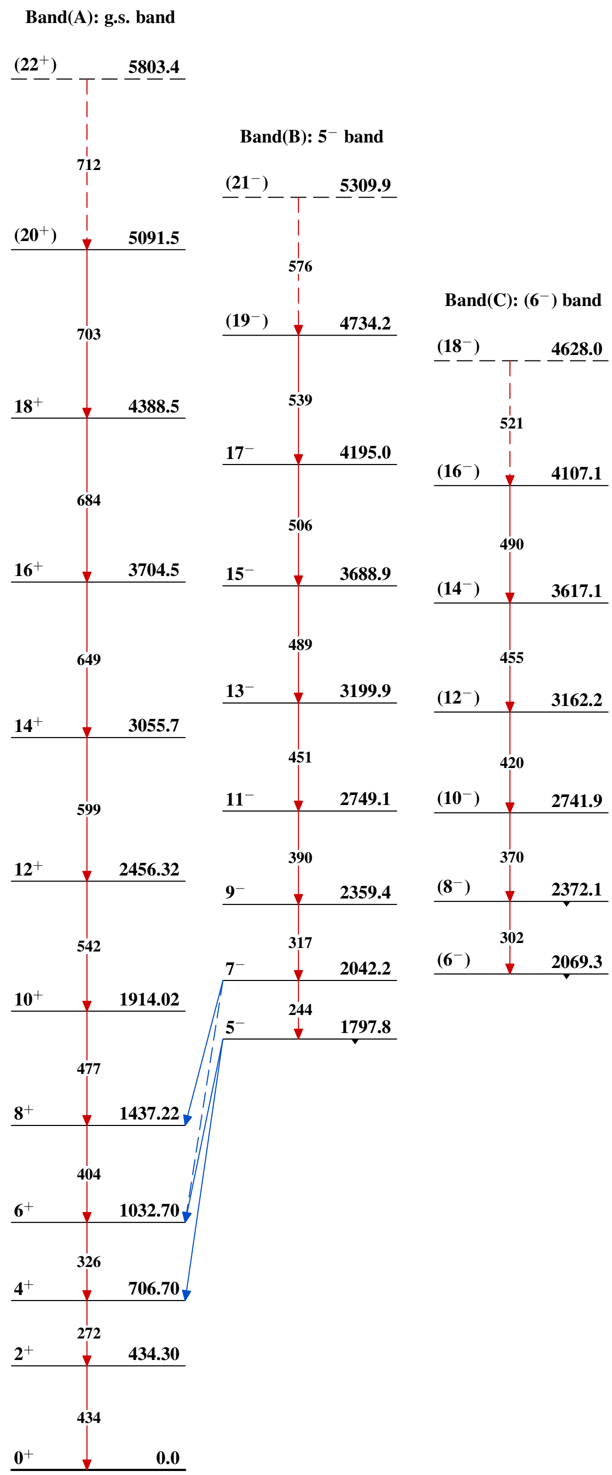
Level Scheme (continued)

Intensities: Relative I_γ



$^{180}_{80}Hg_{100}$

$^{92}Zr(^{90}Zr,2n\gamma)$ 2000Ko48



$^{180}_{80}Hg_{100}$