(HI,xnγ) 2000Ko48,2000Ko01,1997Ca16

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Achterberg, O. A. Capurro, G. V. Marti	NDS 110, 1473 (2009)	31-May-2008

2000Ko48,2000Ko01: ^{103}Rh(^{78}Kr,p2n), E=350 MeV, ATLAS linear accelerator (Argonne National Laboratory). Fragment mass analyzer, GAMMASPHERE array with 101 Compton-suppressed Ge detectors. The remainder of the setup is the same as in the case of 1997Ca16 below. See also 2000AbZZ for first draft of resulting partial level scheme.

1997Ca16: ^{103}Rh(^{78}Kr,p2n), E=340 MeV, ATLAS superconducting linear accelerator (Argonne National Laboratory). AYEBALL array of 15 Compton-suppressed Ge detectors and 2 LEP spectrometers, for prompt γ ray detection. Fragment mass analyzer for separation of recoiling evaporation residues; position-sensitive avalanche counter. Residues were implanted in a double-sided Si strip detector for spatial and time correlation studies of the recoil and α ray signals.

^{178}Hg Levels

Level scheme based on α-γ correlations, γγ coincidences, and intensity balances.

E(level)	J^{π} †	Comments
0.0‡	0^+	J^{π}: g.s. of even-even nucleus.
558.00‡ *20*	2^+	
1012.4‡ *3*	4^+	
1346.9‡ *4*	6^+	
1357.8 *6*	(3^-)	
1447.2 *6*	3^-	
1743.5‡ *5*	8^+	
1851.4 *8*	(4^-)	
1990.2 *5*	5^-	
2157.0 *8*	(5^-)	
2201.2‡ *7*	10^+	
2215.3 *8*	(6^-)	
2388.6# *6*	7^-	
2711.6‡ *8*	12^+	
2730.0# *7*	9^-	
3117.7# *8*	11^-	
3265.2‡ *9*	14^+	
3539.1# *10*	13^-	
3853.8‡ *11*	16^+	
3980.4# *12*	(15^-)	
4454.4# *14*	(17^-)	
4469.3‡ *14*	(18^+)	
4971.9# *17*	(19^-)	
5090.3‡ *16*	(20^+)	
5534.5# *18*	(21^-)	

† From 2000Ko48, based on multipolarity of connecting transition, and band sequence.

‡ Band(A): Band 1 Positive-parity g.s. band. Levels connected by stretched E2 transitions (1997Ca16,2000Ko01).

Band(B): Band 2 Negative-parity band. Levels connected by stretched E2 transitions (200Ko48,2000Ko01).

(HI,xnγ) 2000Ko48,2000Ko01,1997Ca16 (continued)

γ(^{178}Hg)

The anisotropy ratio is defined by R=$I_γ$(<34°>)/$I_γ$(<90°>) (see 2000Ko01,2000Ko48, for more details), where the averages indicate a mean value for detector rings at angles bracketing the quoted value. R>1, generally indicates stretched quadrupole, or mixed ΔJ=1 M1/E2 transitions, with δ>0. Values of R<1, are associated with either a pure dipole, or a mixed M1/E2, ΔJ=1, transition, with δ<0.

$E_γ$ †	$I_γ$ #	E_i(level)	$J_i^π$	E_f	$J_f^π$	Mult. @	α b	$I_{(γ+ce)}$ ‡	Comments
231.5 *8*	2.1 *6*	2388.6	7^-	2157.0	(5^-)	(E2)	0.239 *5*		
334.5& *2*	61.1 *13*	1346.9	6^+	1012.4	4^+	E2	0.0775	59 *7*	A_2=0.28 *11*, A_4=−0.24 *15*, R=1.58 *22*.
341.4a *4*	12.5 *7*	2730.0	9^-	2388.6	7^-	E2	0.0732		A_2=0.34 *11*, A_4=0.00 *15*, R=1.32 *18*.
363.9 *8*	2.0 *5*	2215.3	(6^-)	1851.4	(4^-)	(E2)	0.0612 *10*		
387.7a *4*	10.6 *7*	3117.7	11^-	2730.0	9^-	E2	0.0515		A_2=0.37 *11*, A_4=−0.06 *15*, R=1.45 *20*.
396.6& *4*	48.5 *24*	1743.5	8^+	1346.9	6^+	E2	0.0485	52 *7*	A_2=0.33 *11*, A_4=0.09 *15*, R=1.21 *12*.
398.4 *4*	13.8 *21*	2388.6	7^-	1990.2	5^-	E2	0.0479		R=1.47 *20*.
421.4a *6*	6.0 *6*	3539.1	13^-	3117.7	11^-	E2	0.0414		R=1.21 *18*.
441.3a *6*	5.4 *6*	3980.4	(15^-)	3539.1	13^-	(E2)	0.0367		
454.4& *2*	74.5 *16*	1012.4	4^+	558.00	2^+	E2	0.0341	63 *9*	A_2=0.29 *7*, A_4=−0.07 *12*, R=1.40 *18*.
457.7& *4*	29.3 *13*	2201.2	10^+	1743.5	8^+	E2	0.0335	22 *6*	A_2=0.27 *5*, A_4=−0.12 *7*, R=1.43 *18*.
474.0a *8*	1.9 *9*	4454.4	(17^-)	3980.4	(15^-)	(E2)	0.0307		
510.4& *4*	21.8 *9*	2711.6	12^+	2201.2	10^+	E2	0.0256	24 *4*	A_2=0.41 *21*, A_4=−0.16 *27*, R=1.52 *23*.
517.5a *8*	1.4 *8*	4971.9	(19^-)	4454.4	(17^-)	(E2)	0.0248		
542.8 *8*	2.1 *6*	1990.2	5^-	1447.2	3^-	E2	0.0221		R=1.24 *23*.
553.6& *4*	12.7 *8*	3265.2	14^+	2711.6	12^+	E2	0.0211		R=1.47 *25*.
558.0& *2*	100.0 *17*	558.00	2^+	0.0	0^+	E2	0.0208	100 *10*	A_2=0.30 *7*, A_4=−0.15 *8*, R=1.36 *16*.
562.6a *8*	<1.0	5534.5	(21^-)	4971.9	(19^-)	(E2)	0.0204		
588.6& *6*	6.8 *7*	3853.8	16^+	3265.2	14^+	E2	0.0184		R=1.51 *21*.
615.5& *8*	3.0 *5*	4469.3	(18^+)	3853.8	16^+	(E2)	0.01660		
621.0& *8*	<2.0	5090.3	(20^+)	4469.3	(18^+)	(E2)	0.01627		
632.2 *8*	4.0 *7*	1990.2	5^-	1357.8	(3^-)	E2	0.01564		R=1.35 *23*.
644.0c *8*	<1.0	1990.2	5^-	1346.9	6^+	(E1)	0.00530		
644.9 *8*	2.4 *5*	2388.6	7^-	1743.5	8^+	E1	0.00529		R=0.47 *18*.
799.1 *8*	4.7 *11*	2157.0	(5^-)	1357.8	(3^-)	(E2)	0.00947		
799.7 *6*	8.7 *8*	1357.8	(3^-)	558.00	2^+	(E1)	0.00348		R=0.60 *19*.
839.0 *8*	3.4 *5*	1851.4	(4^-)	1012.4	4^+	(E1)	0.00318		R=1.59 *26*.
868.4 *8*	<1.0	2215.3	(6^-)	1346.9	6^+	(E1)	0.00298		
889.1 *6*	6.8 *8*	1447.2	3^-	558.00	2^+	E1	0.00286		R=0.83 *22*.
978.2 *6*	6.7 *9*	1990.2	5^-	1012.4	4^+	E1	0.00240		R=0.69 *20*.
1041.0c *8*	<1.0	2388.6	7^-	1346.9	6^+	(E1)	0.00214		

† Energy uncertainties estimated by the evaluators, based on the range assumed in 2000Ko48, each depending on its experimental γ-ray intensity.
‡ From 1997Ca16.
# From 2000Ko48.

Continued on next page (footnotes at end of table)

(HI,xnγ) 2000Ko48,2000Ko01,1997Ca16 (continued)

$\gamma(^{178}Hg)$ (continued)

[@] From angular distribution coefficients, anisotropy ratios, and band structure (2000Ko48, 19997Ca16).
[&] Connects levels in g.s. Band 1.
[a] Connects levels Band 2.
[b] 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.
[c] Placement of transition in the level scheme is uncertain.

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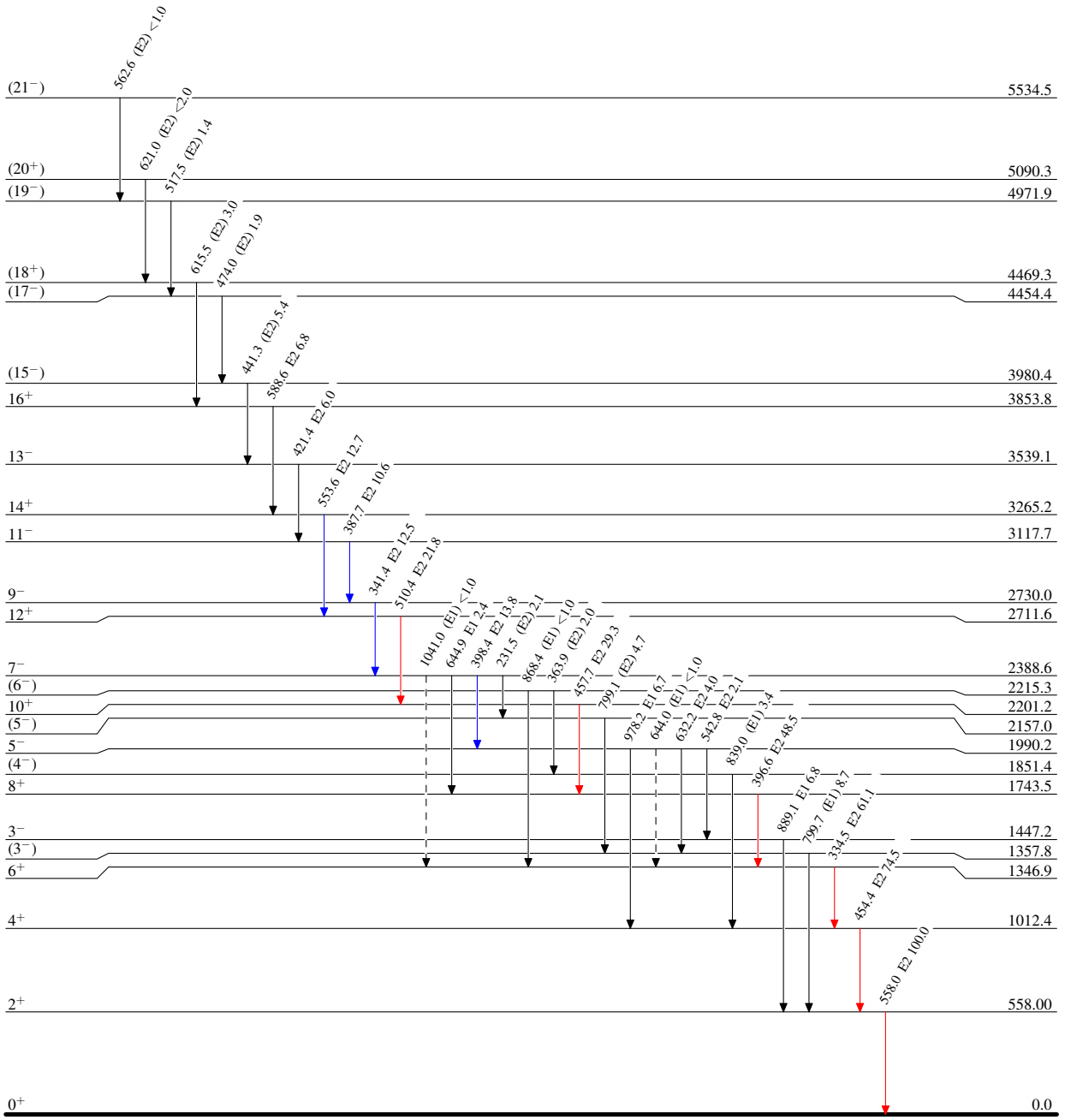
Level Scheme

Intensities: Relative I_γ

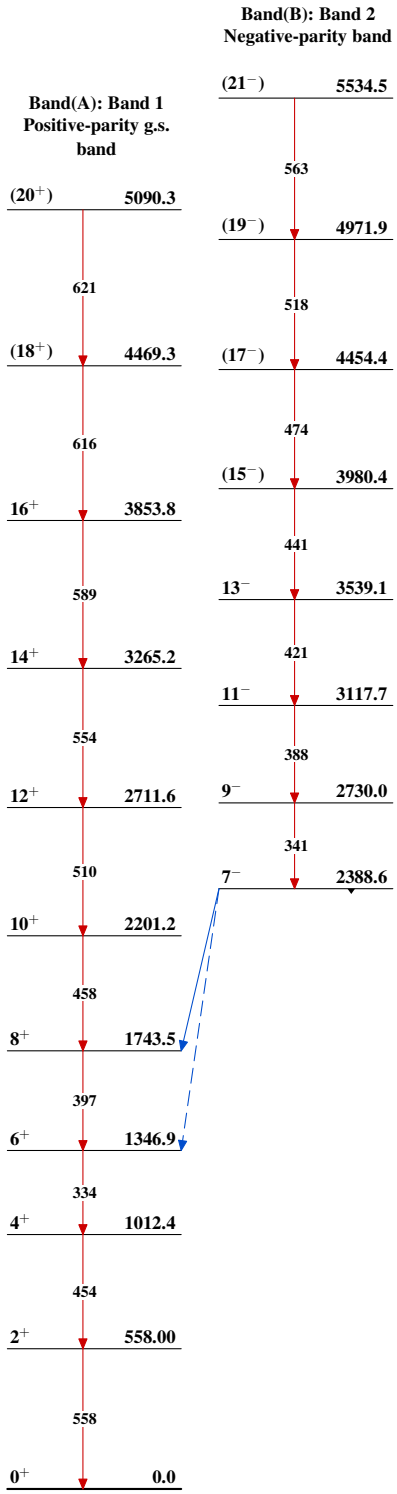
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



$^{178}_{80}Hg_{98}$

(HI,xnγ) 2000Ko48,2000Ko01,1997Ca16



$^{178}_{80}Hg_{98}$