^{50}Cr(^{58}Ni,2p2$\alpha\gamma$) 1997Ce08

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen, Balraj Singh	NDS 164, 1 (2020)	15-Feb-2020

1997Ce08: E=261 MeV ^{58}Ni beam was produced from the tandem accelerator of the Niels Bohr Institute in Denmark. Target was 96.8% enriched ^{50}Cr on an Au backing. γ rays were detected with the NORDBALL array of 15 BGO-shielded Ge detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma(\theta)$(asymmetry). Deduced levels, J, π, γ-ray multipolarities.

All data are from 1997Ce08, unless otherwise noted.

The level scheme is proposed by 1997Ce08 from $\gamma\gamma$ data.

^{98}Pd Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0&	0^+	3989.5 *15*	(10^+)	5701.6& *16*	14^+	7233.5 *16*	(15)
862.9& *5*	2^+	4146.0# *14*	(9^-)	5736.1 *15*	(12^-)	7348.9 *16*	(16^+)
1541.9& *12*	4^+	4187.3 *15*	(10^+)	5859.8 *16*	(14^+)	7867.7 *18*	
2112.9& *14*	6^+	4366.2 *15*	(11^+)	5983.8 *15*	(13^-)	8342.5 *18*	(17^+)
2620.5@ *13*	(5^-)	4448.3& *15*	(12^+)	6320.8 *16*	(14)	8509.1 *17*	(18^+)
2773.9& *15*	8^+	4641.6# *14*	(11^-)	6628.1 *16*	(15^+)	8615.5 *17*	
3379.0# *13*	(7^-)	4677.0 *16*	(12^+)	6751.1& *16*	(16^+)	9137.5 *20*	
3646.0& *15*	10^+	5465.5 *16*	(13^+)	6804.3 *16*	(15^+)	10865.5 *22*	
3753.2 *15*	(9^+)	5505.7 *16*		7159.3 *16*	(15)		

† From a least-squares fit to γ-ray energies, assuming ΔEγ=1 keV for integer Eγ values and 0.5 keV otherwise.

‡ From 1997Ce08, based on γ-ray asymmetry ratios and assuming Mult=E2 for stretched quadrupole transition; assignments for yrast levels are known from previous studies.

Possible configuration=$\pi g_{9/2}^{-3}\otimes\pi p_{1/2}^{-1}$ (1997Ce08).

@ Possible configuration=$\pi g_{9/2}^{-1}\otimes\pi p_{1/2}^{-1}$ (1997Ce08).

& Band(A): Yrast band.

γ(^{98}Pd)

Asymmetry ratio R=2Iγ(143°)/(Iγ(79°)+Iγ(101°)) is from 1997Ce08. A ΔJ=1, dipole is expected to have R≈0.8 and a ΔJ=2, quadrupole R≈1.6 (1997Ce08).

E$_\gamma$	I$_\gamma$†	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.‡	Comments
82.2	2.5 *2*	4448.3	(12^+)	4366.2	(11^+)	(D)	R=0.79 *11*.
123.0	2.5 *1*	6751.1	(16^+)	6628.1	(15^+)	(D)	R=0.75 *7*.
166#	≈1.5#	8509.1	(18^+)	8342.5	(17^+)		
198#	≈0.5#	4187.3	(10^+)	3989.5	(10^+)		
236#	≈2.5#	5701.6	14^+	5465.5	(13^+)		
247.8	2.9 *1*	5983.8	(13^-)	5736.1	(12^-)	(D)	R=0.76 *7*.
310.7	16.8 *2*	4677.0	(12^+)	4366.2	(11^+)	(D)	R=0.79 *2*.
336.9	17.7 *2*	6320.8	(14)	5983.8	(13^-)	(D)	R=0.79 *2*.
343.8	6.4 *1*	3989.5	(10^+)	3646.0	10^+		R=1.33 *5*.
376#	≈2#	4366.2	(11^+)	3989.5	(10^+)		
394.5	3.9 *2*	5859.8	(14^+)	5465.5	(13^+)	(D)	R=0.69 *6*.
434.1	4.5 *2*	4187.3	(10^+)	3753.2	(9^+)	(D)	R=0.89 *7*.
454.4	6.1 *2*	4641.6	(11^-)	4187.3	(10^+)	(D)	R=0.78 *6*.

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^{50}Cr(^{58}Ni,2p2$\alpha\gamma$) 1997Ce08 (continued)

γ(^{98}Pd) (continued)

E_γ	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡	Comments
459#	≈1.2#	4448.3	(12$^+$)	3989.5	(10$^+$)		
478#	≈4#	5983.8	(13$^-$)	5505.7			
495.6	8.4 *2*	4641.6	(11$^-$)	4146.0	(9$^-$)	(Q)	R=1.49 *8*.
519#	≈3.5#	7867.7		7348.9	(16$^+$)		
522#	≈6#	9137.5		8615.5			
545#	≈5#	7348.9	(16$^+$)	6804.3	(15$^+$)		
571#	≈77#	2112.9	6$^+$	1541.9	4$^+$		
652.4	1.8 *2*	4641.6	(11$^-$)	3989.5	(10$^+$)	(D)	R=0.81 *15*.
661#	≈73#	2773.9	8$^+$	2112.9	6$^+$		
679#	≈90#	1541.9	4$^+$	862.9	2$^+$		
720.5@	≈19@	4366.2	(11$^+$)	3646.0	10$^+$		I_γ: total Iγ=26.9 *4*. Intensity divided (evaluator) on the basis of arrow thickness in figure 1 of 1997Ce08. R=0.86 *2* for doublet indicates mult=dipole.
720.5@	≈8@	7348.9	(16$^+$)	6628.1	(15$^+$)		
748#	≈1.2#	8615.5		7867.7			
758.5	9.0 *3*	3379.0	(7$^-$)	2620.5	(5$^-$)	(Q)	R=1.49 *9*.
767.0	8.7 *5*	4146.0	(9$^-$)	3379.0	(7$^-$)	(Q)	R=1.50 *18*.
768.7	4.3 *6*	6628.1	(15$^+$)	5859.8	(14$^+$)	(D)	R=0.85 *24*.
788#	≈1.9#	5465.5	(13$^+$)	4677.0	(12$^+$)		
802#	≈21#	4448.3	(12$^+$)	3646.0	10$^+$		
838.5	7.0 *3*	7159.3	(15)	6320.8	(14)	(D)	R=0.73 *6*.
862.9	100.0	862.9	2$^+$	0.0	0$^+$	(Q)	R=1.38 *2*.
864#	≈10#	5505.7		4641.6	(11$^-$)		
872#	≈65#	3646.0	10$^+$	2773.9	8$^+$		
891.4	7.2 *3*	6751.1	(16$^+$)	5859.8	(14$^+$)	(Q)	R=1.27 *9*.
912.7	5.0 *2*	7233.5	(15)	6320.8	(14)	(D)	R=0.78 *8*.
925.9	13.8 *3*	6628.1	(15$^+$)	5701.6	14$^+$	(D)	R=0.89 *4*.
944.1	6.1 *3*	6804.3	(15$^+$)	5859.8	(14$^+$)	(D)	R=0.86 *9*.
979.2	5.0 *3*	3753.2	(9$^+$)	2773.9	8$^+$		R=1.62 *16* indicates stretched quadrupole, but ΔJ=1, D+Q is likely due to the 454γ-434γ-979γ cascade from (11$^-$) to (8$^+$), with 454γ and 434γ as stretched dipoles (1997Ce08).
993#	≈3.5#	8342.5	(17$^+$)	7348.9	(16$^+$)		
995.2	4.9 *3*	4641.6	(11$^-$)	3646.0	10$^+$	(D)	R=0.73 *8*.
1017.4	9.5 *3*	5465.5	(13$^+$)	4448.3	(12$^+$)	(D)	R=1.12 *7*.
1049.2	10.6 *3*	6751.1	(16$^+$)	5701.6	14$^+$	(Q)	R=1.38 *8*.
1078.6	8.6 *3*	2620.5	(5$^-$)	1541.9	4$^+$	(D)	R=0.70 *5*.
1094.5	3.7 *3*	5736.1	(12$^-$)	4641.6	(11$^-$)	(D)	R=0.75 *10*.
1103.1	2.7 *3*	6804.3	(15$^+$)	5701.6	14$^+$	(D)	R=0.98 *20*.
1160.3	5.9 *3*	8509.1	(18$^+$)	7348.9	(16$^+$)	(Q)	R=1.25 *11*.
1182.9	12.6 *3*	5859.8	(14$^+$)	4677.0	(12$^+$)	(Q)	R=1.43 *8*.
1253#	≈30#	5701.6	14$^+$	4448.3	(12$^+$)		
1266.5	5.9 *3*	8615.5		7348.9	(16$^+$)		R=1.25 *11*.
1342.1	9.9 *4*	5983.8	(13$^-$)	4641.6	(11$^-$)	(Q)	R=1.30 *9*.
1458#	≈6#	7159.3	(15)	5701.6	14$^+$		
1647.5	3.0 *2*	7348.9	(16$^+$)	5701.6	14$^+$	(Q)	R=1.28 *17*.
1728#	≈5#	10865.5		9137.5			

† Quoted values are the original values in 1997Ce08 divided by 10.
‡ From γ asymmetry ratios in 1997Ce08. These assignments are considered tentative since firm assignments would be inferred from

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^{50}Cr(^{58}Ni,2p2$\alpha\gamma$) 1997Ce08 (continued)

$\gamma(^{98}Pd)$ (continued)

a full angular distribution (1997Ce08).

[#] From Figure 1 of 1997Ce08, with intensities roughly estimated (evaluators) from thickness of transition arrows. No tabulated data are given for these transitions in this short report by 1997Ce08.

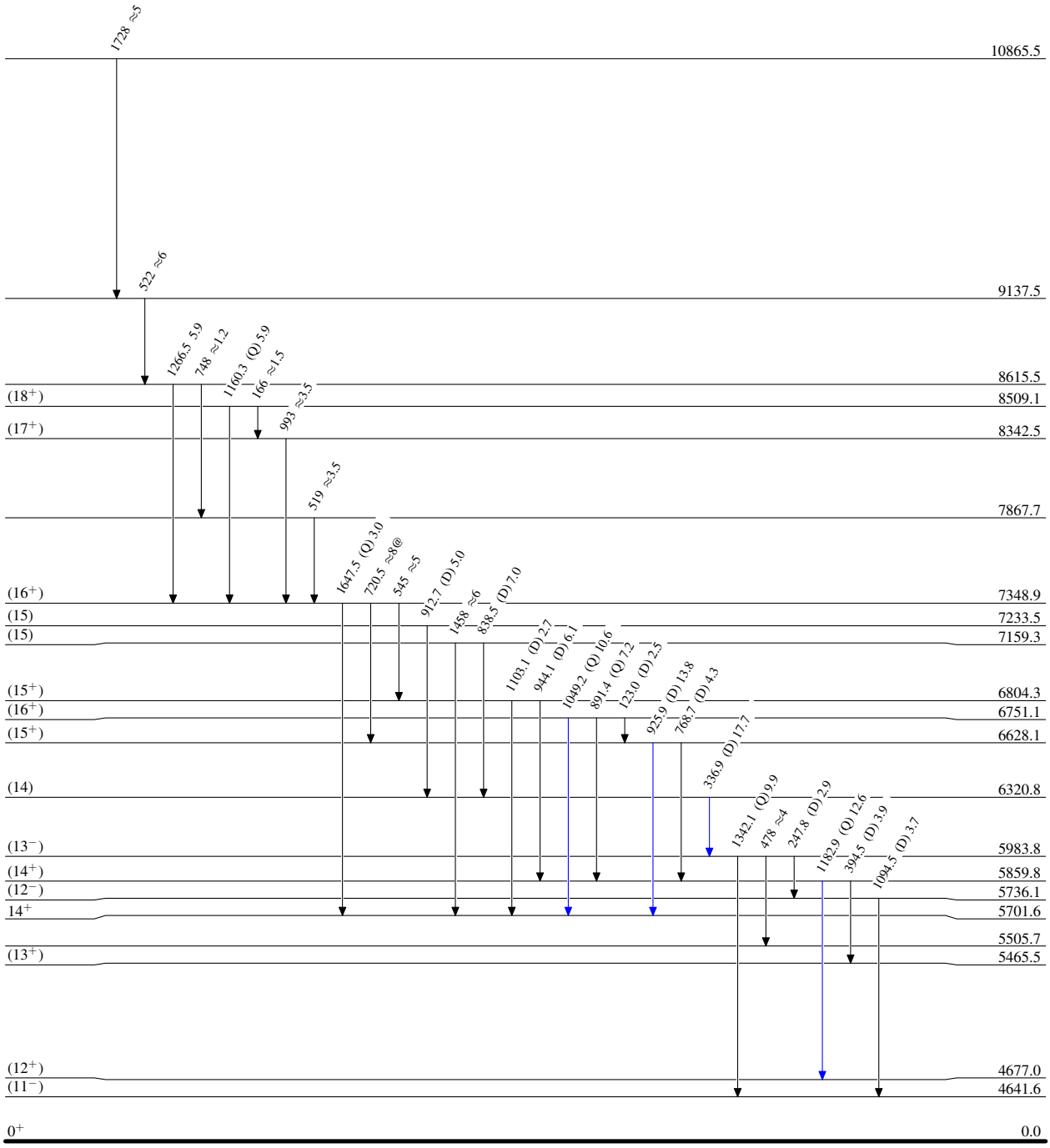
[@] Multiply placed with intensity suitably divided.

^{50}Cr(^{58}Ni,2p2$\alpha\gamma$) 1997Ce08

Level Scheme

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

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



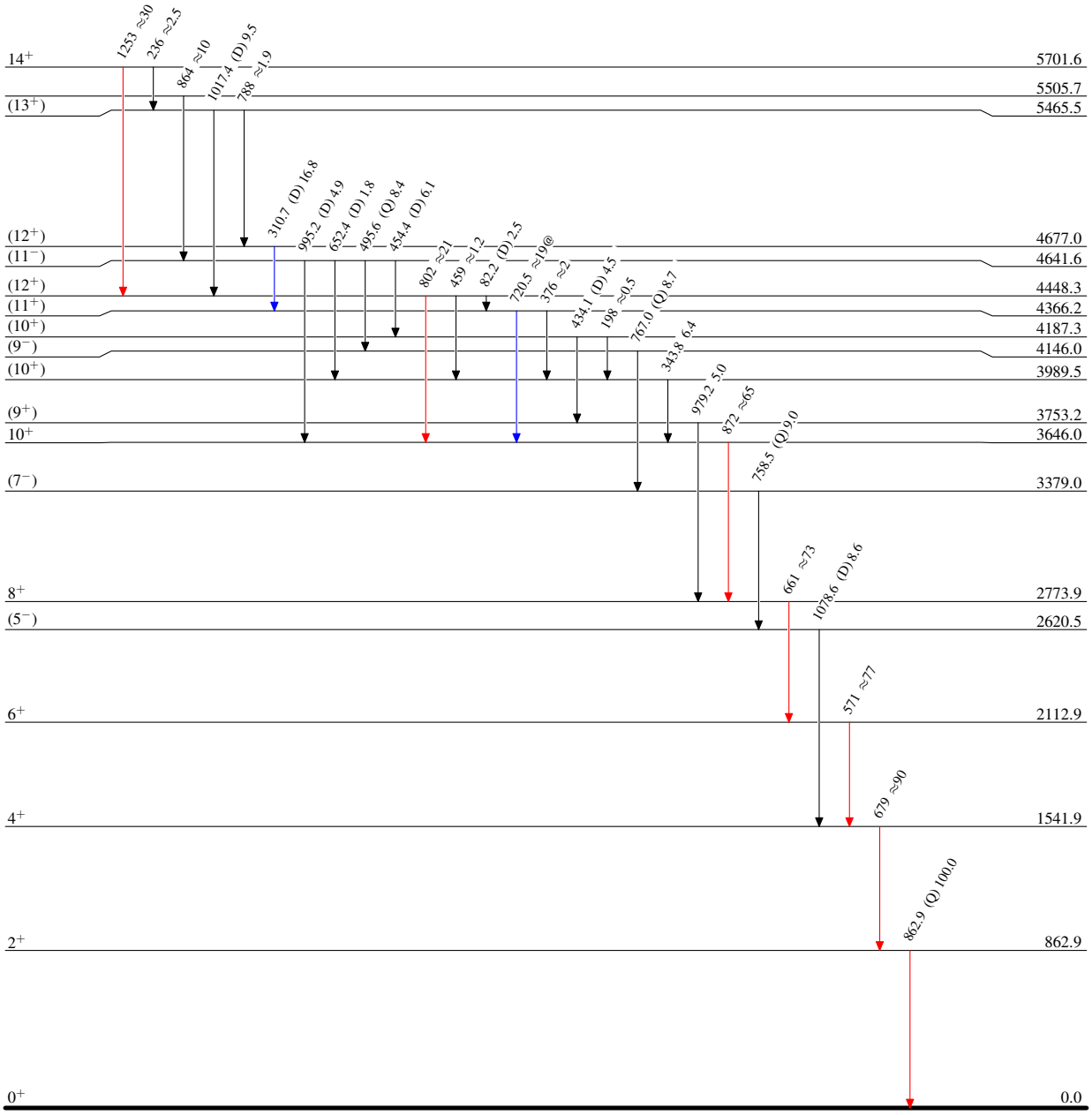
$^{98}_{46}Pd_{52}$

^{50}Cr(^{58}Ni,2p2$\alpha\gamma$) 1997Ce08

Level Scheme (continued)

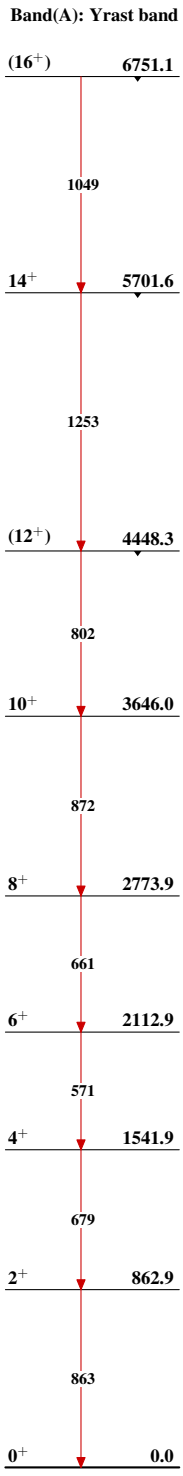
Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

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



$^{98}_{46}Pd_{52}$

^{50}Cr(^{58}Ni,2p2$\alpha\gamma$) 1997Ce08



$^{98}_{46}Pd_{52}$