^{92}Zr(^{13}C,3nγ),^{94}Zr(^{12}C,4nγ) 1981Pi02

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	D. De Frenne	NDS 110,1745 (2009)	31-Dec-2008

1981Pi02: ^{92}Zr(^{13}C,3nγ), E=56 MeV; ^{94}Zr(^{12}C,4nγ), E=69 MeV; measured: Eγ, Iγ(E), I$\gamma(\theta)$, γ(t), $\gamma\gamma$-coin, linear polarization.

^{102}Pd Levels

E(level)‡	J$^{\pi}$†	Comments
0#	0^+	
556.41# 5	2^+	
1275.78# 10	4^+	
1535.19 18	2^+	
2111.27# 11	6^+	
2111.60 15	3^+	
2137.76 12	4^+	
2294.43 11	(5^+)	
2300.90 10	$(4)^+$	
2474.17 10	5^-	J$^{\pi}$: J=5 from $\gamma(\theta)$ results of 1981Pi02; level populated by E2-cascade from 3727 level ($J^{\pi}=9^-$).
2651.4 4	(4^+)	
2913.88@ 12	6^-	J$^{\pi}$: E2+M1 γ to 5^-; J=5,7 ruled out from $\gamma(\theta)$ and γ(linear pol) results of 1981Pi02.
3012.99# 11	8^+	
3187.97a 12	7^-	
3340.18 12	8^+	
3389.57? 16	(7^-)	
3670.40@ 12	8^-	
3727.64& 12	9^-	
3889.17a 16	(9^-)	
3992.64# 12	10^+	
4033.0 8		
4317.59@ 12	10^-	
4328.62 13	(10^+)	J$^{\pi}$: (E2) γ to 8^+; $\gamma(\theta)$ and γ(linear pol) from 1981Pi02 also consistent with 8^+,9^-.
4432.60& 12	11^-	
4648.0?a 3		
4747.1 3		
5055.03# 13	12^+	
5093.90@ 13	12^-	
5260.52 17	(12^+)	
5325.75& 14	13^-	
5577.0? 4	(13^-)	
5769.5		
5984.59@ 14	14^-	
6138.56 20	14^+	
6222.7?	(14^+)	
6344.83& 16	15^-	
6987.92@ 16	16^-	
7461.13& 19	17^-	

† From $\gamma\gamma$-coin, γ pol,γ mult and band structure.
‡ Deduced by evaluator from a least-squares fit to γ-ray energies.

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^{92}Zr(^{13}C,3nγ),^{94}Zr(^{12}C,4nγ) 1981Pi02 (continued)

^{102}Pd Levels (continued)

[#] Band(A): probable member of the g.s. ΔJ=2 rotational band.
[@] Band(B): probable member of ΔJ=2 rotational band on $J^\pi=6^-$ level.
[&] Band(C): probable member of ΔJ=2 rotational band on $J^\pi=9^-$ level.
[a] Band(D): probable member of ΔJ=2 rotational band on $J^\pi=7^-$ level.

γ(^{102}Pd)

A2,A_4 and Pol from ^{92}Zr(^{13}C,3nγ), E=56 MeV.

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	Comments
172.6 *7*	1.93 *9*	2474.17	5^-	2300.90	$(4)^+$	E1		A_2/A_0=−0.29 *9*, A_4/A_0=+0.05 *8*, Pol=−0.38 *43*.
179.8 *7*	6.37 *14*	2474.17	5^-	2294.43	(5^+)	(E1)		A_2/A_0=+0.41 *6*, A_4/A_0=+0.05 *8*, Pol=−0.45 *24*.
182.4 *7*	3.55 *13*	2294.43	(5^+)	2111.60	3^+			A_2/A_0=−0.09 *4*, A_4/A_0=+0.19 *11*, Pol=−0.16 *20*. I_γ: for an unresolved multiplet. Pol for multiplet.
[x]183.0 *7*	3.55 *13*							E_γ: could be an unresolved multiplet.
274.04 *22*	3.4 *14*	3187.97	7^-	2913.88	6^-	M1+E2	+0.20 *7*	A_2/A_0=+0.051 *50*, A_4/A_0=−0.025 *75*, Pol=−0.26 *10*.
327.14 *15*	10.3 *3*	3340.18	8^+	3012.99	8^+	M1+E2	−0.27 *13*	A_2/A_0=+0.201 *40*, A_4/A_0=0.45 *59*, Pol=0.41 *10*.
335.8 *5*	18.6 *6*	4328.62	(10^+)	3992.64	10^+			A_2/A_0=−0.042 *21*, A_4/A_0=−0.040 *31*, Pol=0.306 *28*. Pol for multiplet. I_γ: for an unresolved multiplet.
336.41 *22*	18.6 *6*	2474.17	5^-	2137.76	4^+	E1		A_2/A_0=−0.042 *21*, A_4/A_0=−0.040 *31*, Pol=0.306 *28*. I_γ: for an unresolved multiplet.
337.3	2.5	3727.64	9^-	3389.57?	(7^-)			
387.57 *3*	3.6 *3*	3727.64	9^-	3340.18	8^+	E1		A_2/A_0=−0.50 *13*, A_4/A_0=+0.13 *19*, Pol=0.35 *15*.
428.5 *4*	3.4 *3*	4317.59	10^-	3889.17	(9^-)	M1+E2	−0.05 *7*	A_2/A_0=−0.26 *10*, A_4/A_0=−0.09 *15*, Pol=−0.30 *12*.
440.00 *18*	13.6 *8*	2913.88	6^-	2474.17	5^-	M1+E2	+0.40 *9*	A_2/A_0=+0.247 *29*, A_4/A_0=+0.018 *42*, Pol=−0.492 *50*.
440.1	2	4432.60	11^-	3992.64	10^+			
482.51 *10*	2.45 *19*	3670.40	8^-	3187.97	7^-	M1+E2	+1.5 *5*	A_2/A_0=+0.40 *11*, A_4/A_0=+0.17 *16*, Pol=−0.46 *20*.
509.1 *9*	4	5769.5		5260.52	(12^+)			
512.5 *9*	<17	2651.4	(4^+)	2137.76	4^+			
539.74 *15*	7.8 *3*	3727.64	9^-	3187.97	7^-	E2		A_2/A_0=+0.248 *47*, A_4/A_0=−0.054 *69*, Pol=0.35 *7*.
556.49 *15*	113 *2*	556.41	2^+	0	0^+	E2		I_γ: 13% of the intensity is an unresolved transition in ^{101}Pd. A_2/A_0=+0.305 *10*, A_4/A_0=−0.092 *10*, Pol=0.454 *14*.
590.2 *3*	4.4 *3*	4317.59	10^-	3727.64	9^-	E2+M1	+0.14 *9*	A_2/A_0=+0.00 *9*, A_4/A_0=−0.12 *13*.
600.6[‡] *7*	3.8 *7*	4328.62	(10^+)	3727.64	9^-	(E1)		
603.6 *5*	0.71 *22*	2137.76	4^+	1535.19	2^+	E2		A_2/A_0=−18 *12*, A_4/A_0=+0.03 *12* $ Pol=0.45 *15*. Pol for multiplet between 600 and 700 keV.
[x]618.2 *5*	5.39 *20*							

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^{92}Zr(^{13}C,3nγ),^{94}Zr(^{12}C,4nγ) 1981Pi02 (continued)

γ(^{102}Pd) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
620.0 *2*	5.39 *20*	2913.88	6^-	2294.43	(5^+)		I_γ: for an unresolved multiplet. A_2/A_0=+0.05 *12*, A_4/A_0=−0.13 *18*, Pol=0.45 *15*.
647.17 *20*	7.67 *25*	4317.59	10^-	3670.40	8^-	E2	A_2/A_0=+0.315 *55*, A_4/A_0=−156 *80*, Pol=0.78 *11*.
701.12 *25*	6.6 *5*	3889.17	(9^-)	3187.97	7^-	E2	A_2/A_0=+0.268 *35*, A_4/A_0=−0.082 *51*, Pol=0.76 *11*.
704.96 *18*	24.7 *5*	4432.60	11^-	3727.64	9^-	E2	A_2/A_0=+0.292 *22*, A_4/A_0=−0.110 *30*, Pol=0.497 *36*.
714.0 *4*	31.3 *10*	3187.97	7^-	2474.17	5^-	E2	A_2/A_0=+0.20 *3*, A_4/A_0=−0.09 *5*, Pol=0.379 *24*. I_γ: 2.4% of the intensity is an unresolved transition in ^{103}Pd. Pol for multiplet.
714.9 *4*	31.3 *10*	3727.64	9^-	3012.99	8^+	E1	A_2/A_0=+0.20 *3*, A_4/A_0=−0.09 *5*, Pol=0.379 *24*. I_γ: 2.4% of the intensity is an unresolved transition in ^{103}Pd. Pol for multiplet.
719.37 *16*	92.3 *9*	1275.78	4^+	556.41	2^+	E2	A_2/A_0=+0.269 *10*, A_4/A_0=−0.069 *12*, Pol=0.431 *24*.
756.21 *25*	12.2 *7*	3670.40	8^-	2913.88	6^-	E2	A_2/A_0=+0.338 *43*, A_4/A_0=−0.076 *6*, Pol=0.431 *24*.
758.5‡ *1*	12.2 *7*	4648.0?		3889.17	(9^-)		Pol=0.54 *13*. I_γ: for an unresolved multiplet. Pol for multiplet.
776.70 *25*	13.3 *4*	5093.90	12^-	4317.59	10^-	E2	A_2/A_0=+0.270 *28*, A_4/A_0=−0.088 *40*, Pol=0.59 *7*.
x812.2 *4*	2.86 *19*						
x820.2 *4*	2.7 *3*						
835.42 *12*	57.9 *8*	2111.27	6^+	1275.78	4^+	E2	A_2/A_0=+0.289 *14*, A_4/A_0=−0.052 *18*, Pol=0.513 *56*.
862.1 *3*	1.5 *3*	2137.76	4^+	1275.78	4^+		A_2/A_0=−0.04 *13*, A_4/A_0=+0.01 *118*, Pol=0.34 *37*.
890.75 *25*	14.9 *4*	5984.59	14^-	5093.90	12^-	E2	A_2/A_0=+0.361 *54*, A_4/A_0=−0.108 *80*, Pol=0.60 *7*.
893.05 *25*	15.2 *3*	5325.75	13^-	4432.60	11^-	E2	A_2/A_0=+0.333 *42*, A_4/A_0=−0.067 *62*, Pol=0. *512 49*.
901.78 *15*	50.0 *4*	3012.99	8^+	2111.27	6^+	E2	A_2/A_0=+0.271 *14*, A_4/A_0=−0.045 *20*, Pol=0.52 *9*.
931.1 *3*	96 *18*	5577.0?	(13^-)	4648.0?		E2	A_2/A_0=+0.289 *49*, A_4/A_0=−0.087 *71*, Pol=0.17.
931.87 *1*	79 *9*	5260.52	(12^+)	4328.62	(10^+)	E2	A_2/A_0=+0.289 *49*, A_4/A_0=−0.087 *71*, Pol=0.29 *17*.
962.2‡ *4*	4.2 *4*	6222.7?	(14^+)	5260.52	(12^+)		A_2/A_0=+0.05 *12*, A_4/A_0=−0.14 *17*, Pol=0.20 *32*. E_γ: not observed in other experiments.
979.65 *25*	23.4 *8*	3992.64	10^+	3012.99	8^+	E2	A_2/A_0=+0.251 *22*, A_4/A_0=−0.052 *32*, Pol=0.638 *59*.
988.3 *3*	2.6 *17*	4328.62	(10^+)	3340.18	8^+	(E2)	A_2/A_0=+0.02 *11*, A_4/A_0=+0.04 *16*, Pol=0.68 *24*.
1003.2 *3*	5.78 *20*	6987.92	16^-	5984.59	14^-	E2	A_2/A_0=+0.25 *7*, A_4/A_0=−0.021 *10*, Pol=0.64 *18*.
1018.6 *4*	15.18 *24*	2294.43	(5^+)	1275.78	4^+		I_γ: for an unresolved multiplet. A_2/A_0=+0.236 *29*, A_4/A_0=−0.048 *42*, Pol=0.49 *20*. Pol for multiplet.
1019.0‡ *4*	1.18 *24*	4033.0		3012.99	8^+	E2	A_2/A_0=+0.236 *29*, A_4/A_0=−0.048 *45*, Pol=0.49 *8*. I_γ: for an unresolved multiplet. Pol for multiplet.
1019.0 *4*	15.18 *24*	4747.1		3727.64	9^-		A_2/A_0=+0.236 *29*, A_4/A_0=−0.048 *42*, Pol=0.49 *8*. I_γ: for an unresolved multiplet. Pol for multiplet.
1019.0 *4*	15.18 *24*	6344.83	15^-	5325.75	13^-	E2	A_2/A_0=+0.236 *29*, A_4/A_0=−0.048 *42*, Pol=0.49 *8*. I_γ: for an unresolved multiplet. Pol for multiplet.
1062.25 *18*	9.58 *20*	5055.03	12^+	3992.64	10^+	E2	A_2/A_0=+0.240 *51*, A_4/A_0=−0.032 *75*, Pol=0.58 *13*.
x1073.9 *4*	1.74 *20*						
x1076.0 *4*	2.34 *20*						
1083.7 *3*	5.37 *23*	6138.56	14^+	5055.03	12^+	E2	A_2/A_0=+0.226 *66*, A_4/A_0=−0.0141 *98*, Pol=0.39 *25*. I_γ: 1.4% of the intensity is an unresolved transition in ^{103}Pd and 9.0% is due to a transition in ^{99}Ru.
1116.8 *4*	4.7 *3*	7461.13	17^-	6344.83	15^-	E2	A_2/A_0=+0.34 *10*, A_4/A_0=−0.04 *14*, Pol=0.66 *28*.
1198.29 *10*	3.10 *16*	2474.17	5^-	1275.78	4^+	E1	A_2/A_0=−0.23 *11*, A_4/A_0=−0.0516$ Pol=−0.28 *29*.

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^{92}Zr(^{13}C,3nγ),^{94}Zr(^{12}C,4nγ) 1981Pi02 (continued)

γ(^{102}Pd) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	Comments
1228.9 *4*	1.21 *19*	3340.18	8^+	2111.27	6^+	(E2)		Pol=0.39 *61*.
1278.9 *4*	3.21 *17*	3389.57?	(7^-)	2111.27	6^+	E1		A_2/A_0=−0.25 *10*, A_4/A_0=−0.12 *15*, Pol=0.45 *28*.
1315.8‡ *7*	2.01 *13*	4328.62	(10^+)	3012.99	8^+	(E2)		A_2/A_0=+0.05 *17*, A_4/A_0=0.00 *24*.
x1332.1 *7*	3.84 *23*							
x1352.5 *8*	1.19 *23*							
1375.8 *4*	1.87 *18*	2651.4	(4^+)	1275.78	4^+	M1+E2	+0.61 *63*	A_2/A_0=+0.43 *15*, A_4/A_0=+0.12 *22* $ Pol=0.48 *52*.
x1493.6 *7*	1.33 *13*							
1535.19 *50*	0.88 *9*	1535.19	2^+	0	0^+			
1556.1 *5*	2.33 *13*	2111.60	3^+	556.41	2^+			A_2/A_0=−0.07 *13*, A_4/A_0=+0.16 *19*, Pol=−0.21 *51*.
1581.94 *20*	9.43 *22*	2137.76	4^+	556.41	2^+	E2		A_2/A_0=+0.281 *45*, A_4/A_0=−0.038 *65*, Pol=0.23 *23*.
1744.3 *4*	1.94 *18*	2300.90	$(4)^+$	556.41	2^+	E2		A_2/A_0=+0.26 *16*, A_4/A_0=−0.19 *224*.

† From ^{92}Zr(^{13}C,3nγ), E=56 MeV.
‡ Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

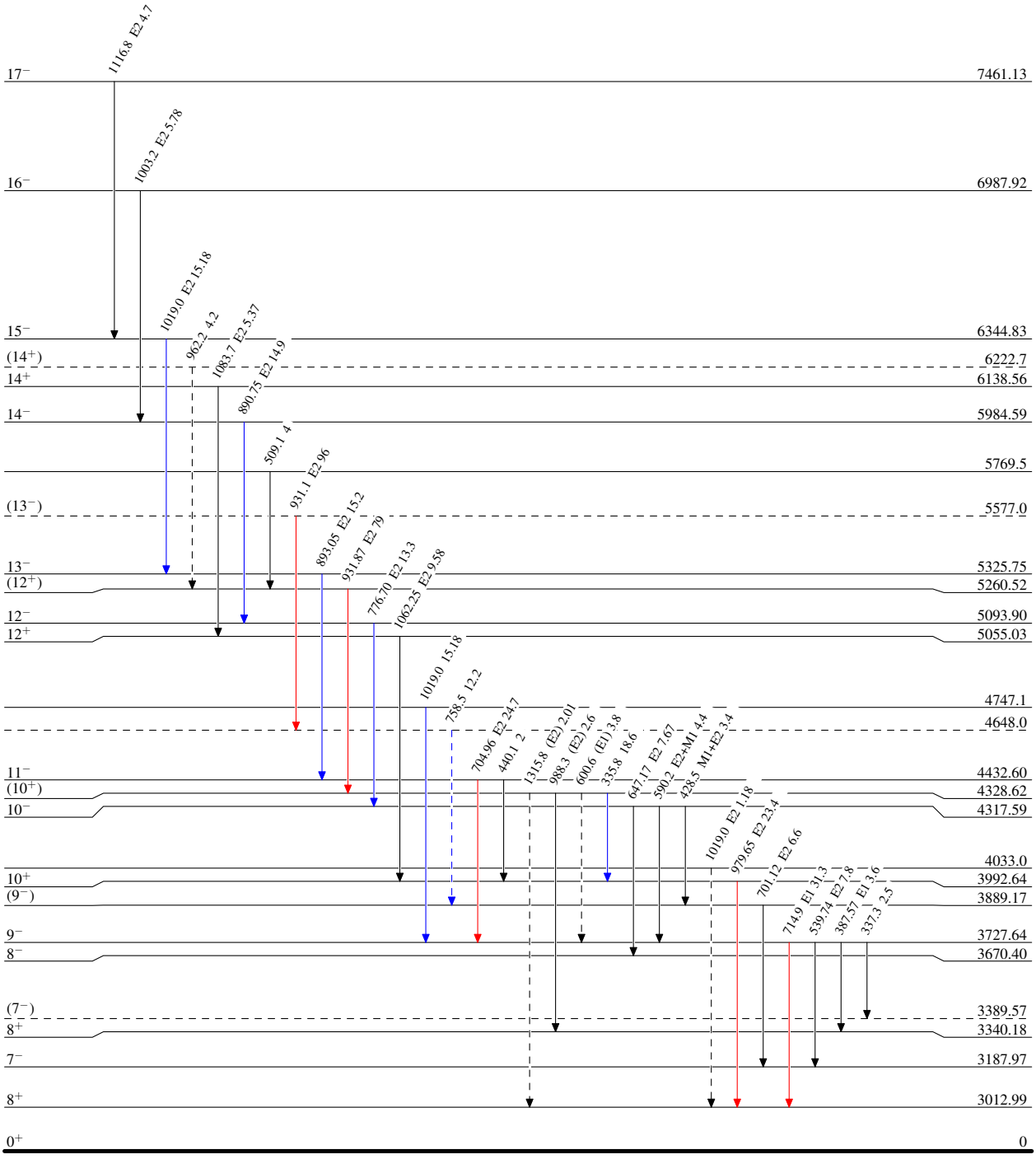
^{92}Zr(^{13}C,3nγ),^{94}Zr(^{12}C,4nγ) 1981Pi02

Level Scheme

Intensities: Type not specified

Legend

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

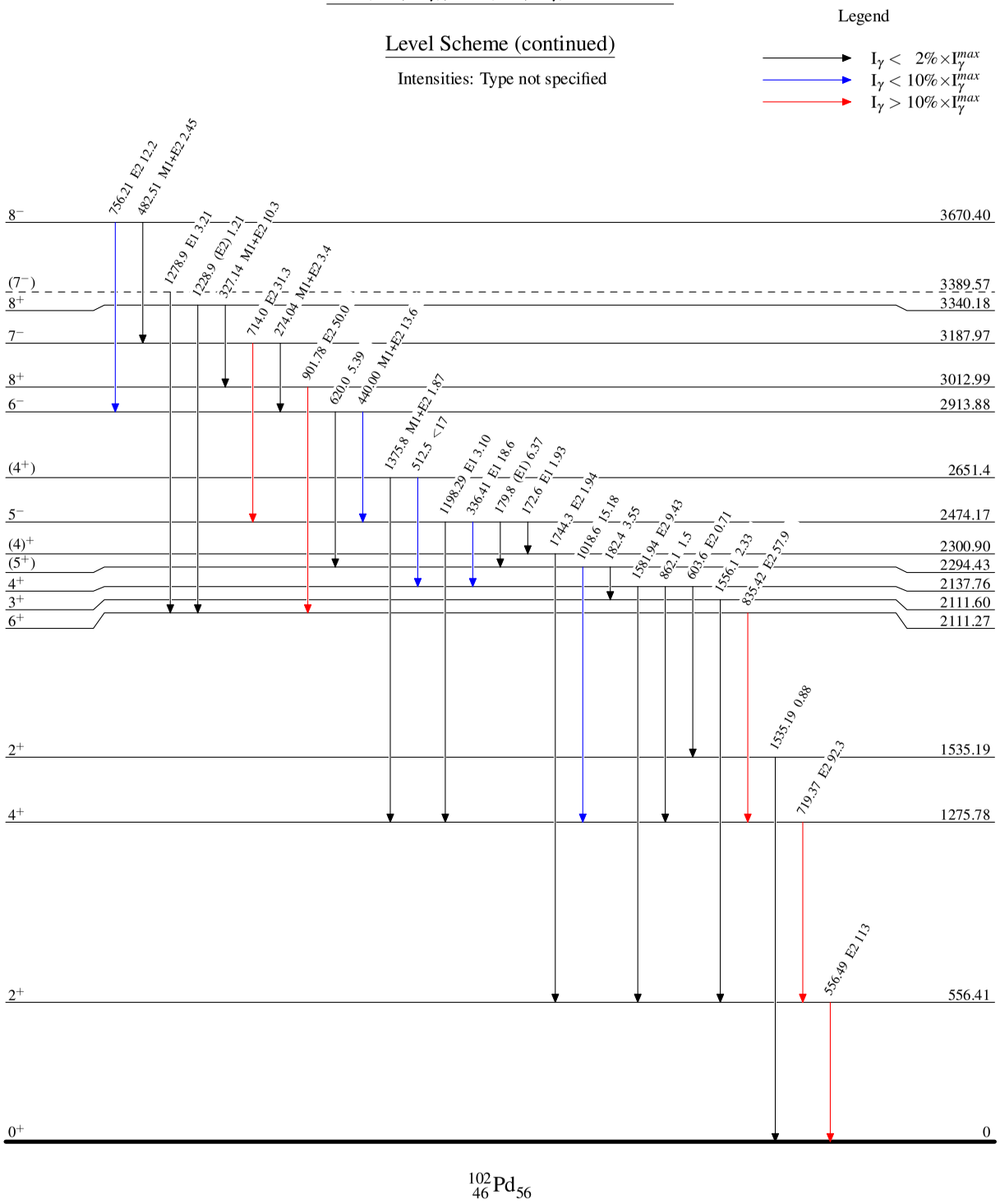


$^{102}_{46}Pd_{56}$

^{92}Zr(^{13}C,3nγ),^{94}Zr(^{12}C,4nγ) 1981Pi02

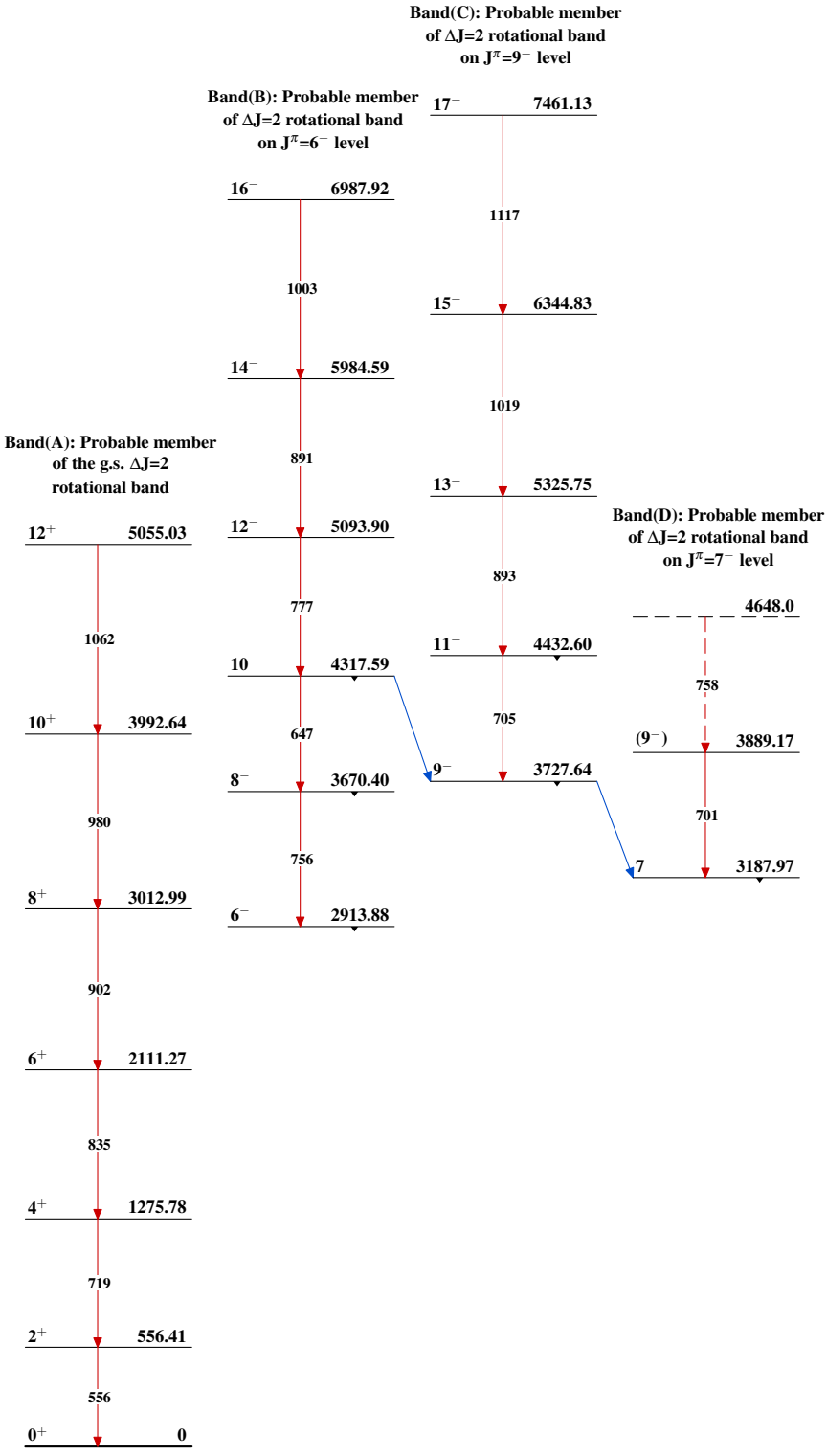
Level Scheme (continued)

Intensities: Type not specified



$^{102}_{46}Pd_{56}$

^{92}Zr(^{13}C,3nγ),^{94}Zr(^{12}C,4nγ) 1981Pi02



$^{102}_{46}Pd_{56}$