^{64}Ni(^{56}Fe,2p2nγ) 1997Se04

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 111, 717 (2010)	1-Dec-2009

Includes ^{90}Zr(^{31}P,3p2nγ); taken from XUNDL.

^{64}Ni(^{56}Fe,2p2nγ) E=236 MeV. Measured Eγ, Iγ, γγ, γγ(θ)(DCO) using GAMMASPHERE with 35 HPGe detectors. Also ^{90}Zr(^{31}P,3p2nγ) at E=150 MeV. Parts of the level scheme from (^{56}Fe,2p2nγ) reaction were verified via ^{90}Zr(^{31}P,3p2nγ) reaction at E=150 using EUROGAM II array with 54 HPGe detectors.

^{116}Te Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0	0+	4585.0# 5	(12+)	7091.8a 5	19−	10303.6# 17	(24+)
680.30& 20	2+	4702.1c 5	12−	7160.4# 17	(18+)	10324.7d 14	(24−)
1358.9& 3	4+	4916.8b 5	(13−)	7173.7d 10	(18−)	10949.6@ 10	(25)
2001.5& 3	6+	4992.4@ 5	13	7307.4c 7	(18−)	11129.8a 6	27−
2772.0& 4	8+	5107.9& 5	14+	7642.0@ 5	(19)	11494.4# 18	(26+)
3026.2b 4	7−	5195.5c 5	14−	7642.1& 6	20+	11538.8d 15	(26−)
3173.5c 4	8−	5236.3d 5	(14−)	7729.1b 6	(19−)	12714.9# 18	(28+)
3428.0b 4	9−	5472.6# 6	(14+)	8119.6a 5	21−	12841.7d 17	(28−)
3573.5& 4	10+	5618.8& 5	16+	8123.3# 17	(20+)	13988.4# 19	(30+)
3682.8# 4	10+	5721.5b 5	(15−)	8173.2d 11	(20−)	14228.1d 18	(30−)
3697.0 4	10+	5772.8@ 5	15	8667.6a 6	22−	15335.8# 20	(32+)
3745.0@ 4	9	6103.4 5	(16+)	8683.2@ 7	(21)	15671?d 3	(32−)
3751.9d 4	10−	6128.8c 5	(16−)	8995.5 6	23−	16743.6# 21	(34+)
3991.8c 4	10−	6141.9d 6	(16−)	9171.9# 17	(22+)	18231.2# 22	(36+)
4226.0b 4	(11−)	6274.4# 7	(16+)	9204.9d 13	(22−)	19871# 3	(38+)
4326.3@ 4	11	6651.9b 5	(17−)	9756.4a 6	24−	21702# 3	(40+)
4337.6& 4	12+	6659.3@ 5	(17)	9775.6@ 9	(23)	23721# 4	(42+)
4436.6d 5	(12−)	6673.2& 5	18+	10058.6a 6	25−		

† From least-squares fit (by compiler) to Eγ's.
‡ Based on γγ(θ)(DCO) data, linear polarization data and band assignments (1997Se04).
# Band(A): Band #1, based on 10+. Proposed configuration=π[($g_{7/2}$,$d_{5/2}$)^2($g_{9/2}$)$^{-2}$($h_{11/2}$)^2] ν[($g_{7/2}$,$d_{5/2}$)^{10}($h_{11/2}$)^4].
@ Band(B): Band #2, based on 9.
& Band(C): Band #3, g.s. band.
a Band(D): Band #4, based on 19−.
b Band(E): Band #5, based on 7−.
c Band(F): Band #6, based on 8−.
d Band(G): Band #7, based on 10−.

γ(^{116}Te)

Eγ	Iγ	Ei(level)	Jiπ	Ef	Jfπ	Mult.	δ	Comments
147.3 2	12.1 4	3173.5	8−	3026.2	7−	M1+E2	+0.078 20	Mult.: DCO=0.89 32.
254.7 2	2.1 1	3428.0	9−	3173.5	8−	M1+E2	+0.19 6	Mult.: DCO=0.61 27, P(lin pol)=−0.13 17.
278.6 2	5.8 2	5195.5	14−	4916.8	(13−)	(M1,E2)		
302.2 2	8.9 3	10058.6	25−	9756.4	24−	M1+E2	+0.14 5	Mult.: DCO=0.59 3, P(lin pol)=+0.08 6.
418.7 2	18.8 6	7091.8	19−	6673.2	18+	E1(+M2)	−0.025 26	Mult.: DCO=0.49 2, P(lin pol)=+0.24 8.

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^{64}Ni(^{56}Fe,2p2nγ) 1997Se04 (continued)

γ(^{116}Te) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	Comments
477.5 *2*	2.1 *1*	8119.6	21^-	7642.1	20^+	E1		
493.3 *2*	5.5 *2*	5195.5	14^-	4702.1	12^-	E2		Mult.: DCO=0.97 *17*, P(lin pol)=0.57 *10*.
511.0 *2*	45.0 *14*	5618.8	16^+	5107.9	14^+	E2		Mult.: DCO=1.00 *3*, P(lin pol)=0.31 *4*.
525.8 *2*	2.0 *2*	5721.5	(15^-)	5195.5	14^-	(M1,E2)		
547.9 *2*	9.7 *3*	8667.6	22^-	8119.6	21^-	M1(+E2)	−0.035 *50*	Mult.: DCO=0.43 *2*, P(lin pol)=−0.06 *6*.
578.5 *2*	2.8 *2*	3751.9	10^-	3173.5	8^-	E2		Mult.: DCO=0.97 *17*.
581.5 *2*	7.7 *3*	4326.3	11	3745.0	9	E2		Mult.: DCO=1.02 *13*.
640.7 *2*	6.1 *2*	4337.6	12^+	3697.0	10^+	E2		Mult.: DCO=0.98 *22*.
642.6 *2*	93 *3*	2001.5	6^+	1358.9	4^+	E2		Mult.: DCO=0.99 *2*, P(lin pol)=+0.37 *4*.
656.4 *2*	7.0 *3*	3428.0	9^-	2772.0	8^+	E1(+M2)	0.00 *3*	Mult.: DCO=0.54 *6*, P(lin pol)=+0.25 *8*.
666.0 *2*	6.1 *3*	4992.4	13	4326.3	11	E2		Mult.: DCO=0.66 *9*.
678.6 *2*	95 *3*	1358.9	4^+	680.30	2^+	E2		Mult.: P(lin pol)=+0.27 *3* for 680.3+678.6. DCO=1.0 from systematics.
680.3 *2*	100.0 *10*	680.30	2^+	0	0^+	E2		Mult.: P(lin pol)=+0.27 *3* for 680.3+678.6. DCO=1.0 from systematics.
684.7 *2*	2.7 *4*	4436.6	(12^-)	3751.9	10^-	(E2)		
690.9 *2*	7.2 *3*	4916.8	(13^-)	4226.0	(11^-)	E2		Mult.: DCO=0.77 *14*, P(lin pol)=0.39 *11*.
710.2 *2*	8.0 *3*	4702.1	12^-	3991.8	10^-	E2		Mult.: DCO=0.89 *13*, P(lin pol)=0.51 *10*.
752.6 *2*	2.3 *2*	4326.3	11	3573.5	10^+			Mult.: DCO=0.68 *18*.
761.0 *2*	1.9 *1*	9756.4	24^-	8995.5	23^-	M1,E2		
764.2 *2*	40.0 *13*	4337.6	12^+	3573.5	10^+	E2		Mult.: DCO=0.95 *3*, P(lin pol)=0.35 *5*.
770.3 *2*	44.6 *14*	5107.9	14^+	4337.6	12^+	E2		Mult.: DCO=1.00 *3*, P(lin pol)=0.34 *4*.
770.4 *2*	76.7 *24*	2772.0	8^+	2001.5	6^+	E2		Mult.: DCO=1.00 *3*, P(lin pol)=+0.34 *4*.
780.3 *2*	6.6 *3*	5772.8	15	4992.4	13	E2		Mult.: DCO=0.83 *6*.
798.0 *2*	8.4 *4*	4226.0	(11^-)	3428.0	9^-	(E2)		
799.7 *2*	2.5 *4*	5236.3	(14^-)	4436.6	(12^-)	(E2)		
801.3 *2*	51.3 *16*	3573.5	10^+	2772.0	8^+	E2		Mult.: DCO=0.95 *5*, P(lin pol)=+0.41 *5*.
801.8 *3*	5.3 *10*	6274.4	(16^+)	5472.6	(14^+)	E2		
804.9 *2*	2.6 *2*	5721.5	(15^-)	4916.8	(13^-)	(E2)		
818.3 *2*	7.8 *3*	3991.8	10^-	3173.5	8^-	E2		Mult.: DCO=1.04 *13*, P(lin pol)=0.51 *11*.
875.9 *2*	6.6 *3*	8995.5	23^-	8119.6	21^-	E2		Mult.: DCO=0.87 *7*, P(lin pol)=0.30 *10*.
886.0 *15*	3.7 *6*	7160.4	(18^+)	6274.4	(16^+)	(E2)		
886.4 *2*	4.9 *2*	6659.3	(17)	5772.8	15	(E2)		
887.6 *3*	5.1 *10*	5472.6	(14^+)	4585.0	(12^+)	(E2)		
902.2 *2*	5.4 *3*	4585.0	(12^+)	3682.8	10^+	(E2)		
905.5 *3*	2.4 *4*	6141.9	(16^-)	5236.3	(14^-)	(E2)		
910.8 *2*	5.8 *3*	3682.8	10^+	2772.0	8^+	E2		Mult.: DCO=1.14 *27*.
925.0 *2*	8.0 *4*	3697.0	10^+	2772.0	8^+	E2		Mult.: DCO=0.97 *10*, P(lin pol)=0.26 *12*.
930.4 *2*	3.7 *2*	6651.9	(17^-)	5721.5	(15^-)	(E2)		
933.3 *2*	3.5 *2*	6128.8	(16^-)	5195.5	14^-	(E2)		
962.9 *3*	3.3 *4*	8123.3	(20^+)	7160.4	(18^+)	E2		
968.9 *2*	4.2 *2*	7642.1	20^+	6673.2	18^+	E2		Mult.: DCO=1.03 *16*.
973.1 *2*	4.0 *3*	3745.0	9	2772.0	8^+			Mult.: DCO=0.57 *10*.
982.6 *2*	3.5 *2*	7642.0	(19)	6659.3	(17)	(E2)		
995.5 *2*	3.7 *2*	6103.4	(16^+)	5107.9	14^+	(E2)		
999.6 *3*	2.3 *2*	8173.2	(20^-)	7173.7	(18^-)	(E2)		
1024.7 *2*	8.3 *4*	3026.2	7^-	2001.5	6^+	E1		Mult.: DCO=0.46 *5*. P(lin pol)=+0.22 *6* for 1024.7+1027.9.
1027.9 *2*	16.8 *5*	8119.6	21^-	7091.8	19^-	E2		Mult.: DCO=0.95 *7*. P(lin pol)=+0.22 *6* for 1027.9+1024.7.
1031.6 *8*	2.1 *3*	9204.9	(22^-)	8173.2	(20^-)	(E2)		
1031.8 *8*	2.3 *3*	7173.7	(18^-)	6141.9	(16^-)	(E2)		
1041.1 *4*	1.5 *2*	8683.2	(21)	7642.0	(19)	(E2)		
1048.6 *3*	3.3 *4*	9171.9	(22^+)	8123.3	(20^+)	(E2)		
1054.5 *2*	32.6 *10*	6673.2	18^+	5618.8	16^+	E2		Mult.: DCO=0.98 *9*, P(lin pol)=0.19 *6*.

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^{64}Ni(^{56}Fe,2p2nγ) 1997Se04 (continued)

γ(^{116}Te) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
1071.2 *2*	4.5 *2*	11129.8	27^-	10058.6	25^-	E2	Mult.: DCO=0.98 *13*.
1077.2 *2*	3.2 *2*	7729.1	(19^-)	6651.9	(17^-)	(E2)	
1088.8 *2*	6.8 *3*	9756.4	24^-	8667.6	22^-	E2	Mult.: DCO=0.98 *12*, P(lin pol)=0.28 *11*.
1092.4 *5*	1.2 *2*	9775.6	(23)	8683.2	(21)	(E2)	
1119.8 *5*	1.4 *2*	10324.7	(24^-)	9204.9	(22^-)	(E2)	
1131.7 *3*	3.3 *4*	10303.6	(24^+)	9171.9	(22^+)	(E2)	
1174.0 *5*	1.3 *2*	10949.6	(25)	9775.6	(23)	(E2)	
1178.6 *5*	2.9 *2*	7307.4	(18^-)	6128.8	(16^-)	(E2)	
1190.8 *4*	2.6 *3*	11494.4	(26^+)	10303.6	(24^+)	(E2)	
1214.1 *4*	1.5 *2*	11538.8	(26^-)	10324.7	(24^-)	(E2)	
1220.5 *4*	2.2 *3*	12714.9	(28^+)	11494.4	(26^+)	(E2)	
1273.5 *6*	1.8 *1*	13988.4	(30^+)	12714.9	(28^+)	(E2)	
1302.9 *7*	0.8 *1*	12841.7	(28^-)	11538.8	(26^-)	(E2)	
1347.4 *5*	1.8 *2*	15335.8	(32^+)	13988.4	(30^+)	(E2)	
1386.4 *6*	0.7 *1*	14228.1	(30^-)	12841.7	(28^-)	(E2)	
1407.8 *6*	1.3 *2*	16743.6	(34^+)	15335.8	(32^+)	(E2)	
1443.1[†] *20*	0.1 *1*	15671?	(32^-)	14228.1	(30^-)	(E2)	
1487.6 *8*	0.9 *2*	18231.2	(36^+)	16743.6	(34^+)	(E2)	
1639.4 *14*	0.5 *1*	19871	(38^+)	18231.2	(36^+)	(E2)	
1831.6 *16*	0.3 *1*	21702	(40^+)	19871	(38^+)	(E2)	
2019.1 *20*	0.1 *1*	23721	(42^+)	21702	(40^+)	(E2)	

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

^{64}Ni(^{56}Fe,2p2nγ) 1997Se04

Level Scheme

Intensities: Relative I_γ

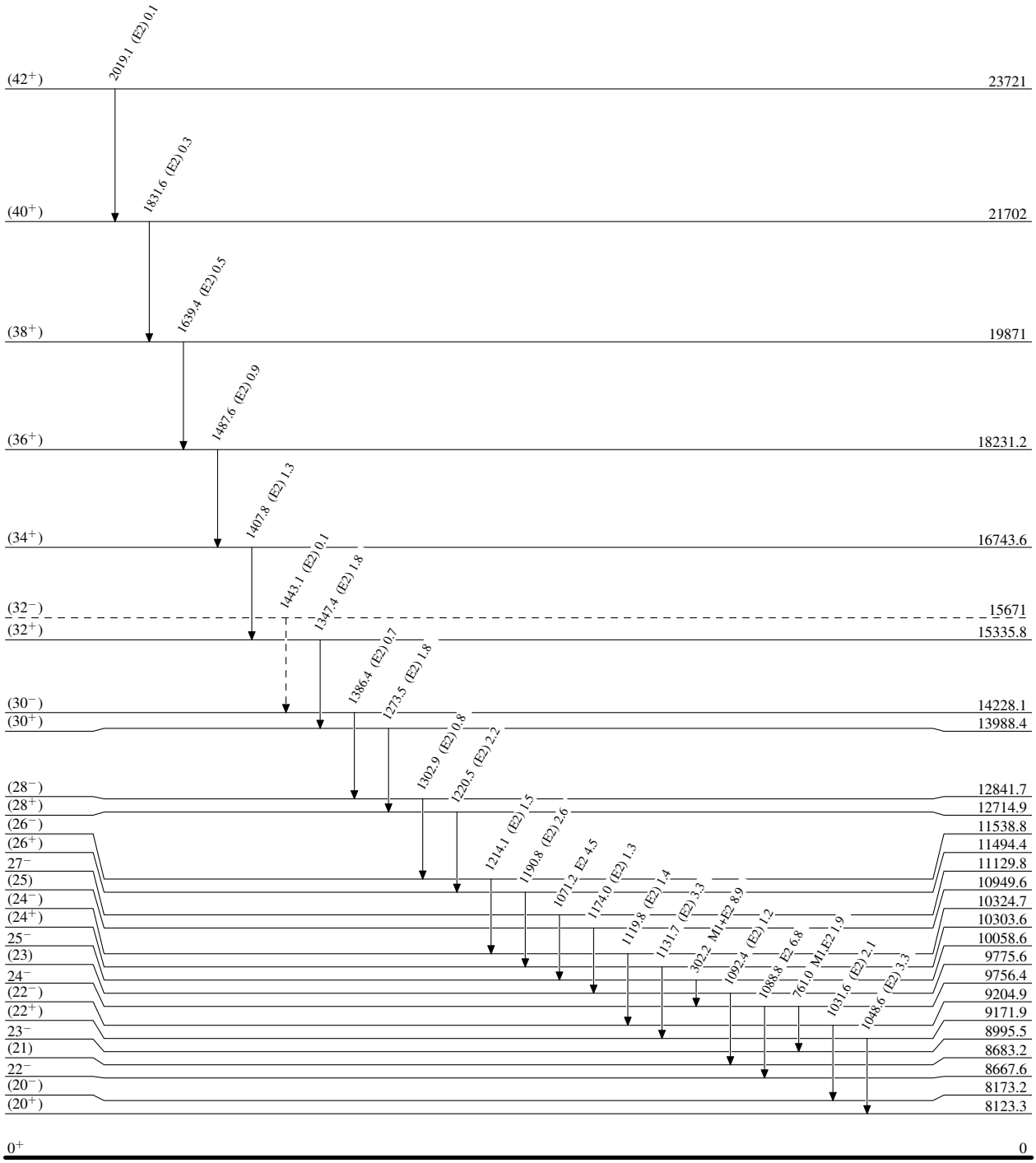
Legend

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

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

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

γ Decay (Uncertain)



$^{116}_{52}Te_{64}$

^{64}Ni(^{56}Fe,2p2nγ) 1997Se04

Level Scheme (continued)

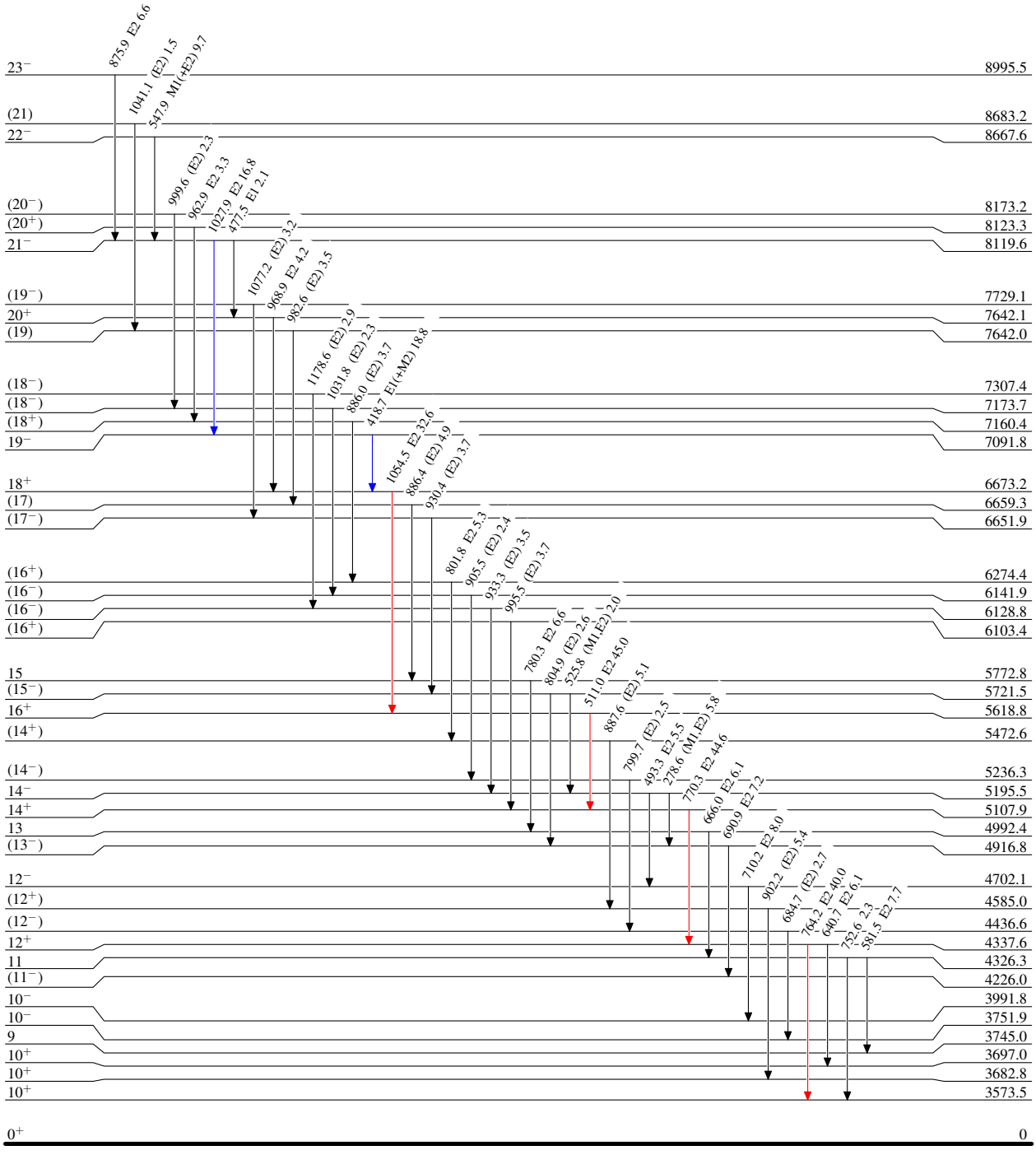
Intensities: Relative I_γ

Legend

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

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

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

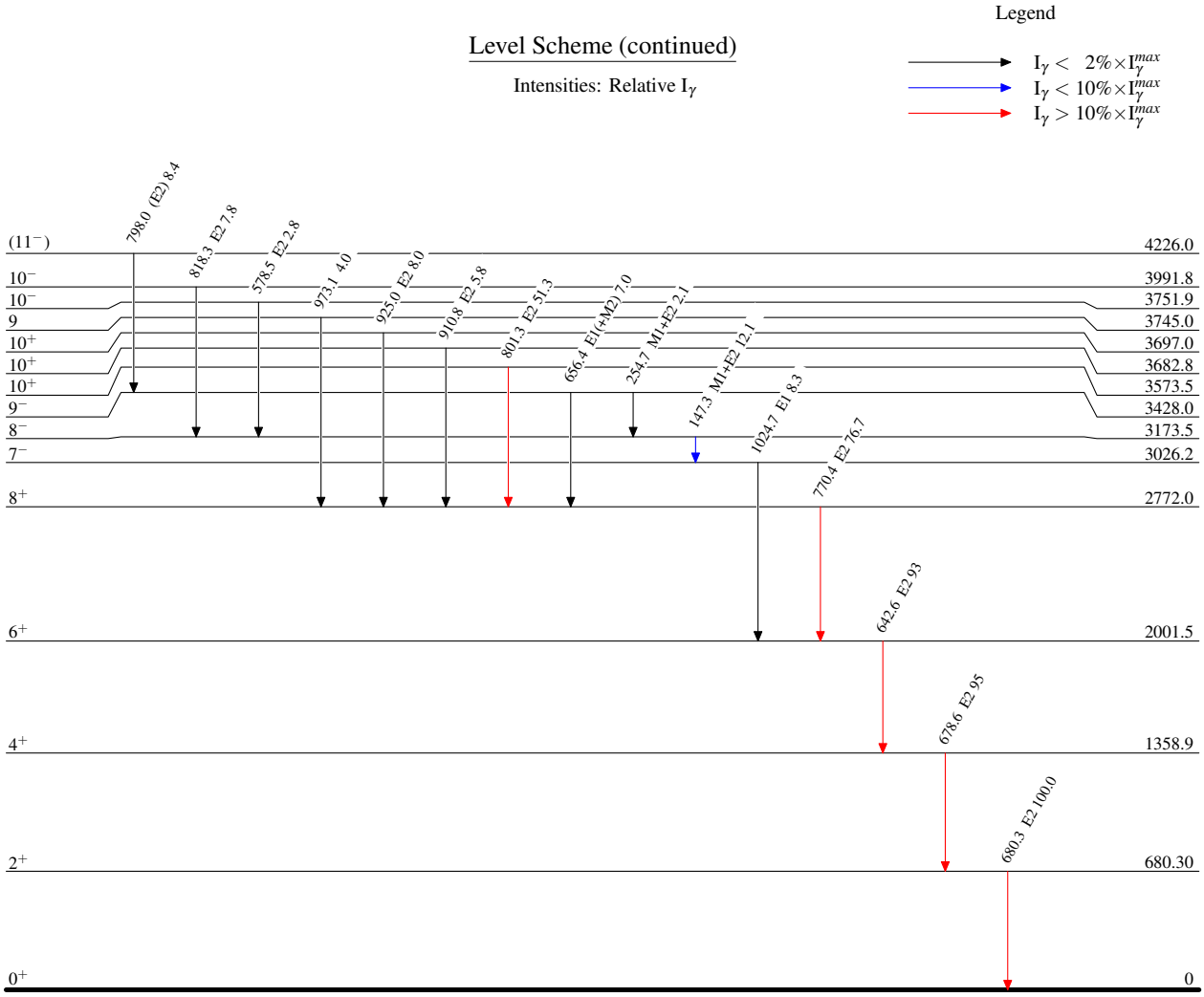


$^{116}_{52}Te_{64}$

^{64}Ni(^{56}Fe,2p2nγ) 1997Se04

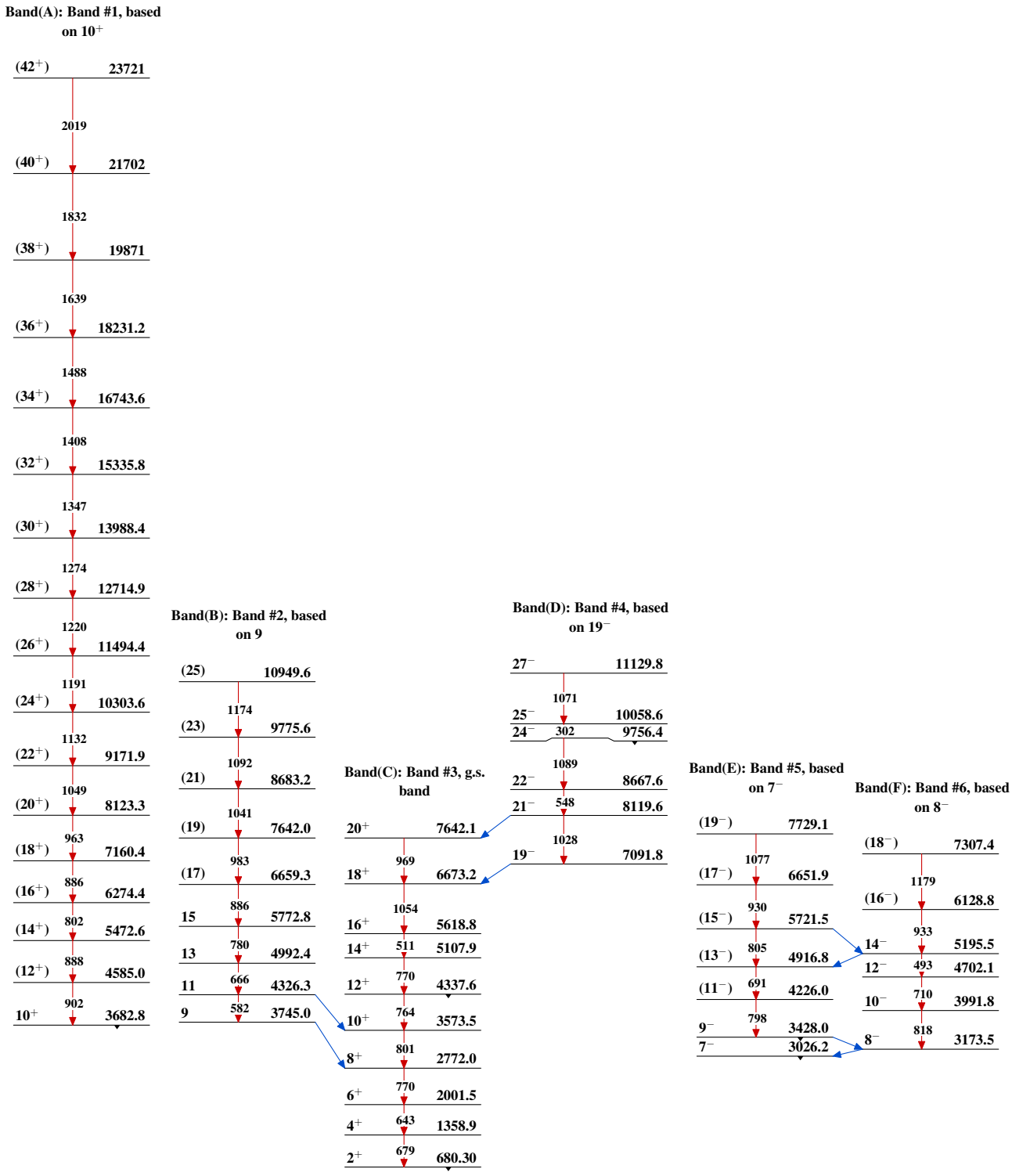
Level Scheme (continued)

Intensities: Relative I_γ



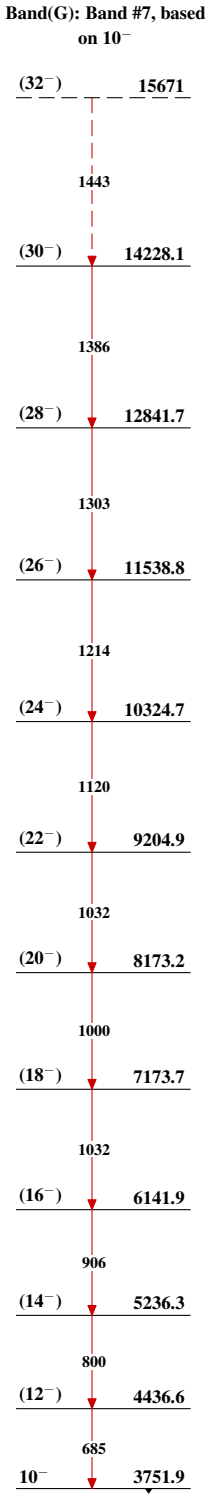
$^{116}_{52}Te_{64}$

^{64}Ni(^{56}Fe,2p2nγ) 1997Se04



$^{116}_{52}Te_{64}$

^{64}Ni(^{56}Fe,2p2nγ) 1997Se04 (continued)



$^{116}_{52}Te_{64}$