^{116}Sn(^{58}Ni,p2nγ) 1999Ba84

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin, E. A. Mccutchan	NDS 151, 334 (2018)	30-Jun-2018

1999Ba84: E=260 MeV, PEX array (4 Compton-suppressed Euroball cluster detectors and Si-ball with 32 elements); E=267 MeV, JUROSPHERE array (25 Compton suppressed Ge detectors, 10 TESSA detectors at 79° and 101°, 15 EUROGAM detectors at 134° and 158°); RITU recoil separator for α decay tagging of gammas; measured Eγ, $\gamma\gamma$ coin, Iγ, (recoil)-γ coin, (recoil)-$\gamma\gamma$ coin, $\gamma(\theta)$.

^{171}Ir Levels

E(level)[†]	J$^{\pi}$[‡]	Comments
0.0+x[@]	11/2$^-$	
436.04+x[#] *4*	13/2$^-$	
633.90+x[@] *4*	15/2$^-$	
997.82+x *16*		
1115.95+x[#] *5*	17/2$^-$	
1353.07+x[@] *7*	19/2$^-$	
1365.77+x[d] *8*	17/2$^-$	
1520.70+x *23*		
1609.30+x[d] *6*	19/2$^-$	
1823.44+x[#] *11*	21/2$^-$	
1884.61+x[d] *7*	21/2$^-$	
2008.47+x[a] *12*	(21/2)	
2106.40+x[@] *13*	23/2$^-$	
2326.71+x[&] *15*	(23/2$^-$)	
2334.14+x[a] *15*	(23/2)	
2335.5+x *10*		
2381.49+x[&] *10*	(25/2$^-$)	
2444.88+x[#] *16*	25/2$^-$	
2496.75+x[&] *11*	(27/2$^-$)	
2589.7+x[e] *3*		
2677.89+x[&] *12*	(29/2$^-$)	
2690.44+x *25*	(25/2)	
2705.16+x[a] *23*	(25/2)	
2730.87+x[@] *21*	27/2$^-$	
2796.9+x[e] *4*		
2945.56+x[&] *13*	(31/2$^-$)	
3096.0+x[e] *4*		
3284.17+x[&] *15*	(33/2$^-$)	
3631.70+x[&] *19*	(35/2$^-$)	
0.0+y[b]	(23/2)	E(level): level decays to 1353+x (19/2$^-$) and 1116+x (17/2$^-$) levels via unidentified linking transitions; so y>1353.
98.00+y[b] *15*	(25/2$^-$)	
223.00+y[b] *20*	(27/2)	
424.18+y[b] *22*	(29/2)	
670.97+y[b] *24*	(31/2)	
955.8+y[b] *3*	(33/2)	
1275.2+y[b] *3*	(35/2)	
1631.0+y[b] *5*	(37/2)	

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^{116}Sn(^{58}Ni,p2nγ) 1999Ba84 (continued)

^{171}Ir Levels (continued)

E(level)[†]	J$^\pi$[‡]	Comments
0.0+z[c]	(9/2$^-$)	E(level): This level feeds the 1253, 19/2$^-$ and 1176, 17/2$^-$ levels, so z>1253.
300.59+z[c] *6*	(13/2$^-$)	
774.50+z[c] *10*	(17/2$^-$)	
1361.65+z[c] *15*	(21/2$^-$)	
1972.15+z[c] *21*	(25/2$^-$)	
2623.7+z[c] *3*	(29/2$^-$)	

[†] From least-squares fit to Eγ.
[‡] Authors′ values based on transition multipolarities, deduced band structure, population strengths and comparison with band structure in heavier Ir isotopes.
[#] Band(A): $\pi h_{11/2}$, α=+1/2 band. Proton probably coupled to triaxially deformed core; band probably crossed at high spin by prolate 3-quasiparticle structure.
[@] Band(a): $\pi h_{11/2}$, α=−1/2 band. See comment on signature partner of this band.
[&] Band(B): π=−, ΔJ=1 band. Lowest-energy level feeds (21/2$^-$) state. Possible configuration=$(\pi h_{11/2})(\nu i_{13/2})^2$.
[a] Band(C): ΔJ=1 3-quasiparticle band. Lowest-energy level feeds (19/2$^-$) g.s. band member.
[b] Band(D): ΔJ=1 3-quasiparticle band. Lowest-energy level feeds (17/2$^-$) and (19/2$^-$) g.s. band members. Possible configuration=$(\pi h_{11/2})(\nu^2)$.
[c] Band(E): Possible $\pi h_{9/2}$ band. Assignment of band to ^{171}Ir is tentative because α tagging spectrum is ambiguous; 301γ and 610γ may be strongly contaminated in that spectrum.
[d] Band(F): π=− band fragment. Lowest-energy level feeds (13/2$^-$) g.s. band member.
[e] Band(G): Band fragment. Lowest-energy level feeds (21/2$^-$) state.

$\gamma(^{171}Ir)$

Eγ	Iγ	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
98.00 *15*		98.00+y	(25/2$^-$)	0.0+y	(23/2)	
115.26 *6*	4.2 *3*	2496.75+x	(27/2$^-$)	2381.49+x	(25/2$^-$)	
125.00 *12*	4.3 *4*	223.00+y	(27/2)	98.00+y	(25/2$^-$)	
181.14 *5*	9.4 *4*	2677.89+x	(29/2$^-$)	2496.75+x	(27/2$^-$)	
197.65 *5*	15.8 *10*	633.90+x	15/2$^-$	436.04+x	13/2$^-$	Eγ: fits this placement very poorly.
201.18 *10*	5.8 *5*	424.18+y	(29/2)	223.00+y	(27/2)	
207.20 *11*	3.3 *3*	2796.9+x		2589.7+x		
236.96 *11*	7.1 *6*	1353.07+x	19/2$^-$	1115.95+x	17/2$^-$	
243.55 *6*	10.5 *5*	1609.30+x	19/2$^-$	1365.77+x	17/2$^-$	A$_2$=+0.05 *10*; consistent with D+Q transition.
246.79 *10*	5.9 *4*	670.97+y	(31/2)	424.18+y	(29/2)	
256.31 *10*	6.4 *5*	1609.30+x	19/2$^-$	1353.07+x	19/2$^-$	
267.67 *5*	10.8 *5*	2945.56+x	(31/2$^-$)	2677.89+x	(29/2$^-$)	
275.31 *4*	60.4 *21*	1884.61+x	21/2$^-$	1609.30+x	19/2$^-$	A$_2$=+0.07 *5*; consistent with D+Q transition.
282.83 *16*	5.5 *6*	2106.40+x	23/2$^-$	1823.44+x	21/2$^-$	
284.82 *13*	5.0 *5*	955.8+y	(33/2)	670.97+y	(31/2)	
285.98 *15*	<7.8	2730.87+x	27/2$^-$	2444.88+x	25/2$^-$	
299.06 *16*	3.0 *3*	3096.0+x		2796.9+x		
300.59 *6*	>17.7	300.59+z	(13/2$^-$)	0.0+z	(9/2$^-$)	
319.45 *14*	4.3 *4*	1275.2+y	(35/2)	955.8+y	(33/2)	
325.67 *9*	8.8 *6*	2334.14+x	(23/2)	2008.47+x	(21/2)	
338.42 *12*	7.6 *7*	2444.88+x	25/2$^-$	2106.40+x	23/2$^-$	
338.61 *7*	6.9 *4*	3284.17+x	(33/2$^-$)	2945.56+x	(31/2$^-$)	
347.53 *11*	3.9 *3*	3631.70+x	(35/2$^-$)	3284.17+x	(33/2$^-$)	
355.8 *3*	1.5 *3*	1631.0+y	(37/2)	1275.2+y	(35/2)	

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^{116}Sn(^{58}Ni,p2nγ) 1999Ba84 (continued)

$\gamma(^{171}Ir)$ (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
356.30 *19*	3.2 *4*	2690.44+x	(25/2)	2334.14+x	(23/2)		
371.02 *17*	4.3 *5*	2705.16+x	(25/2)	2334.14+x	(23/2)		
435.97 *4*	46.1 *25*	436.04+x	13/2$^-$	0.0+x	11/2$^-$		A_2=+0.25 *3*.
442.10 *13*	8.4 *7*	2326.71+x	(23/2$^-$)	1884.61+x	21/2$^-$		
470.49 *14*	11.2 *10*	1823.44+x	21/2$^-$	1353.07+x	19/2$^-$		
473.91 *8*	18.9 *12*	774.50+z	(17/2$^-$)	300.59+z	(13/2$^-$)		
481.94 *4*	63 *3*	1115.95+x	17/2$^-$	633.90+x	15/2$^-$		
493.32 *4*	53.9 *21*	1609.30+x	19/2$^-$	1115.95+x	17/2$^-$		A_2=0.00 *6*; consistent with D+Q transition.
496.88 *6*	30.6 *13*	2381.49+x	(25/2$^-$)	1884.61+x	21/2$^-$		
522.88 *17*	10.7 *10*	1520.70+x		997.82+x			
531 *3*	0.6 *8*	1884.61+x	21/2$^-$	1353.07+x	19/2$^-$		
561.78 *15*	14.6 *15*	997.82+x		436.04+x	13/2$^-$		
587.15 *11*	12.6 *9*	1361.65+z	(21/2$^-$)	774.50+z	(17/2$^-$)		
610.49 *14*	9.7 *7*	1972.15+z	(25/2$^-$)	1361.65+z	(21/2$^-$)		
621.63 *22*	10.9 *12*	2444.88+x	25/2$^-$	1823.44+x	21/2$^-$		
624.5 *4*	6.0 *10*	2730.87+x	27/2$^-$	2106.40+x	23/2$^-$		
634.00 *5*	101 *8*	633.90+x	15/2$^-$	0.0+x	11/2$^-$	Q	Mult.: A_2=+0.32 *4*.
651.60 *19*	6.7 *6*	2623.7+z	(29/2$^-$)	1972.15+z	(25/2$^-$)		
655.39 *10*	25.2 *16*	2008.47+x	(21/2)	1353.07+x	19/2$^-$		
680.09 *7*	34.8 *17*	1115.95+x	17/2$^-$	436.04+x	13/2$^-$	Q	Mult.: A_2=+0.26 *6*.
705.1 *3*	2.6 *7*	2589.7+x		1884.61+x	21/2$^-$		
707.24 *18*	14.7 *13*	1823.44+x	21/2$^-$	1115.95+x	17/2$^-$		
719.32 *7*	65 *3*	1353.07+x	19/2$^-$	633.90+x	15/2$^-$	Q	Mult.: A_2=+0.37 *4*.
753.35 *14*	18.3 *13*	2106.40+x	23/2$^-$	1353.07+x	19/2$^-$		
929.83 *12*	14.8 *15*	1365.77+x	17/2$^-$	436.04+x	13/2$^-$		
982.4 *10*	3.1 *11*	2335.5+x		1353.07+x	19/2$^-$		

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Level Scheme

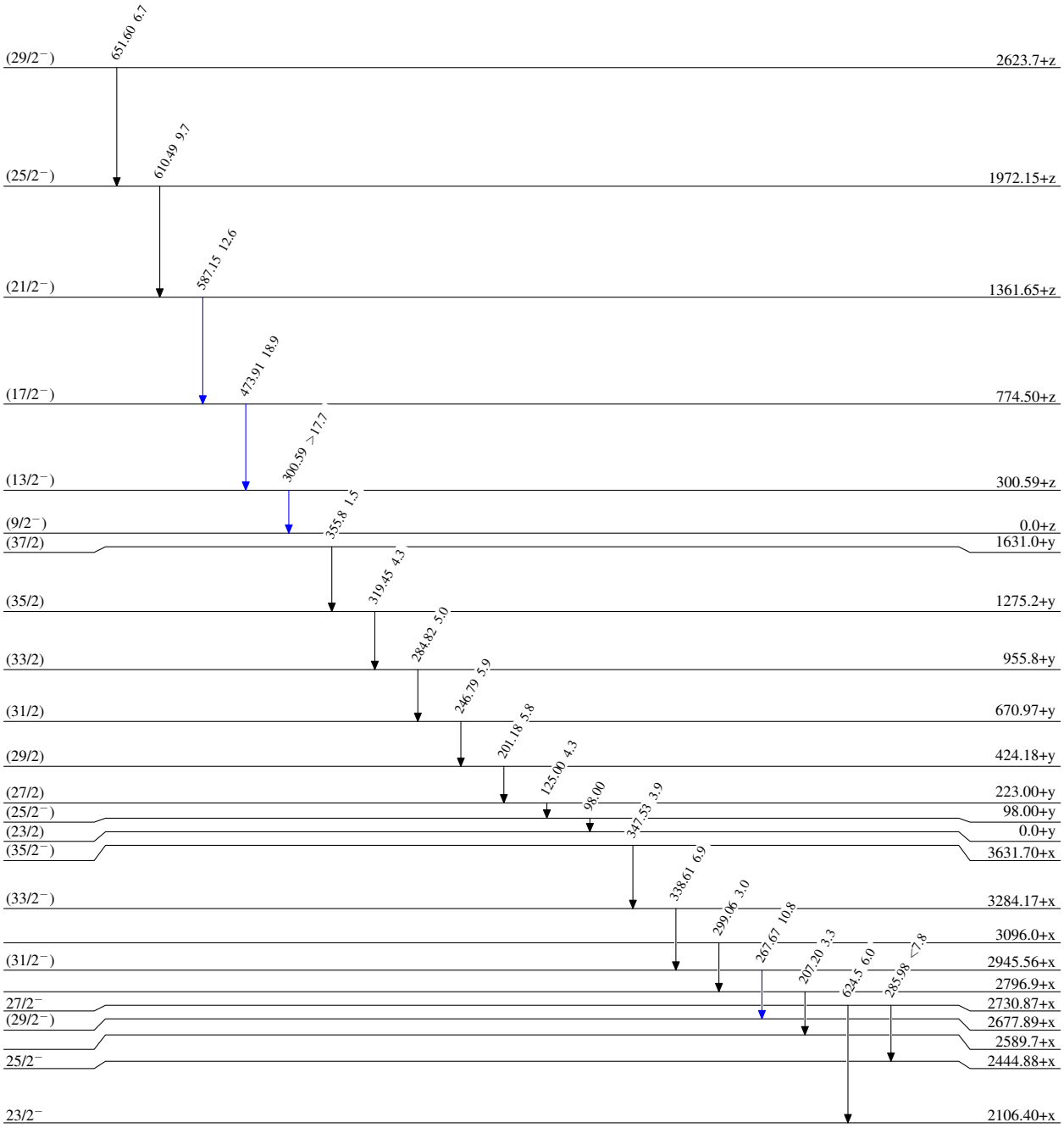
Intensities: Relative I_γ

Legend

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

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

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

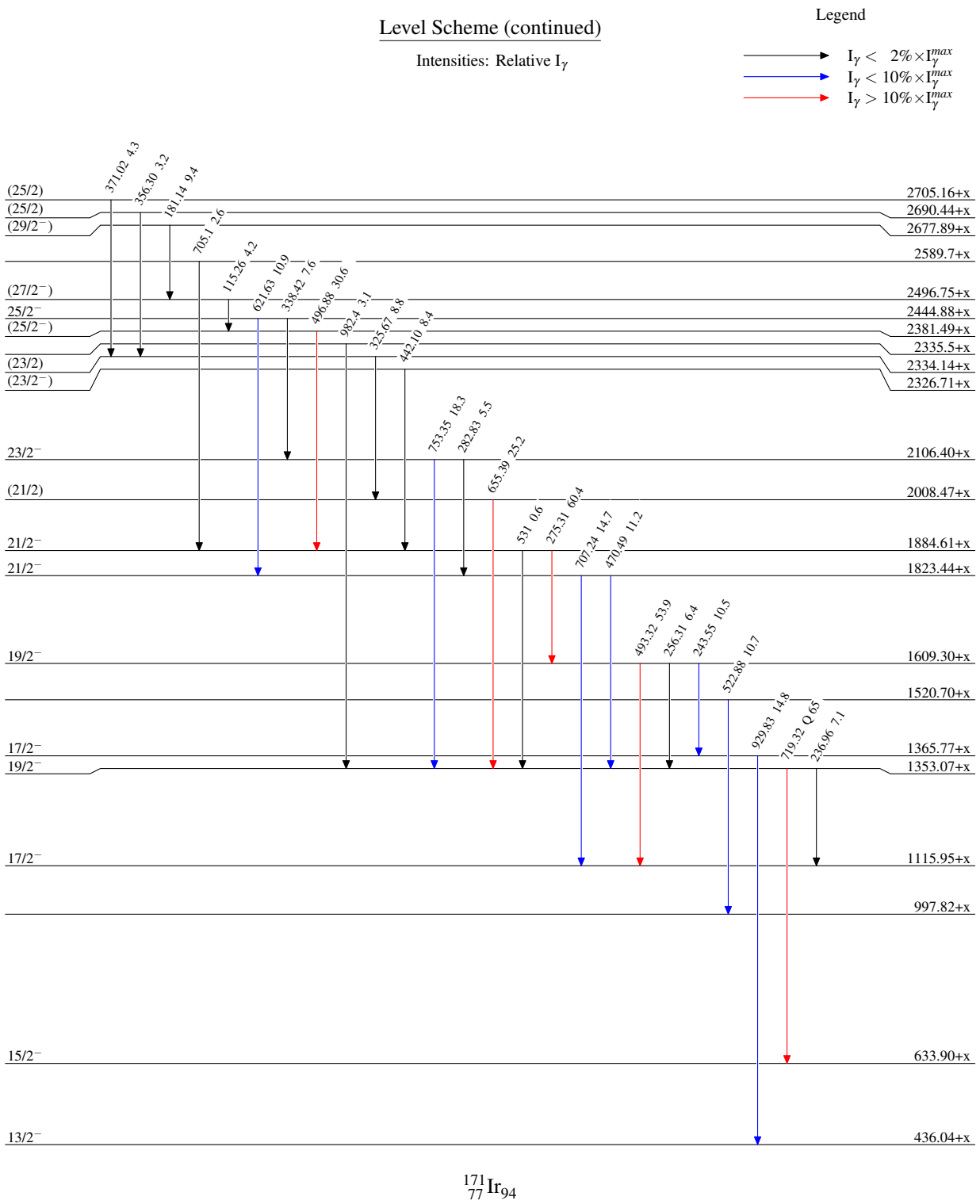


$^{171}_{77}Ir_{94}$

^{116}Sn(^{58}Ni,p2nγ) 1999Ba84

Level Scheme (continued)

Intensities: Relative I_γ



$^{171}_{77}Ir_{94}$

^{116}Sn(^{58}Ni,p2nγ) 1999Ba84

Level Scheme (continued)

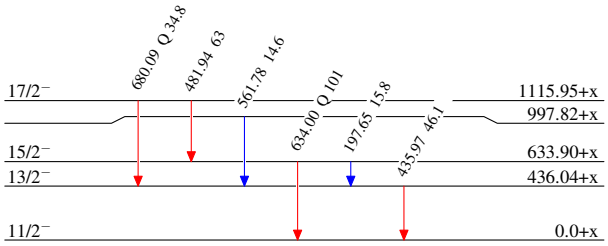
Intensities: Relative I_γ

Legend

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

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

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



$^{171}_{77}Ir_{94}$

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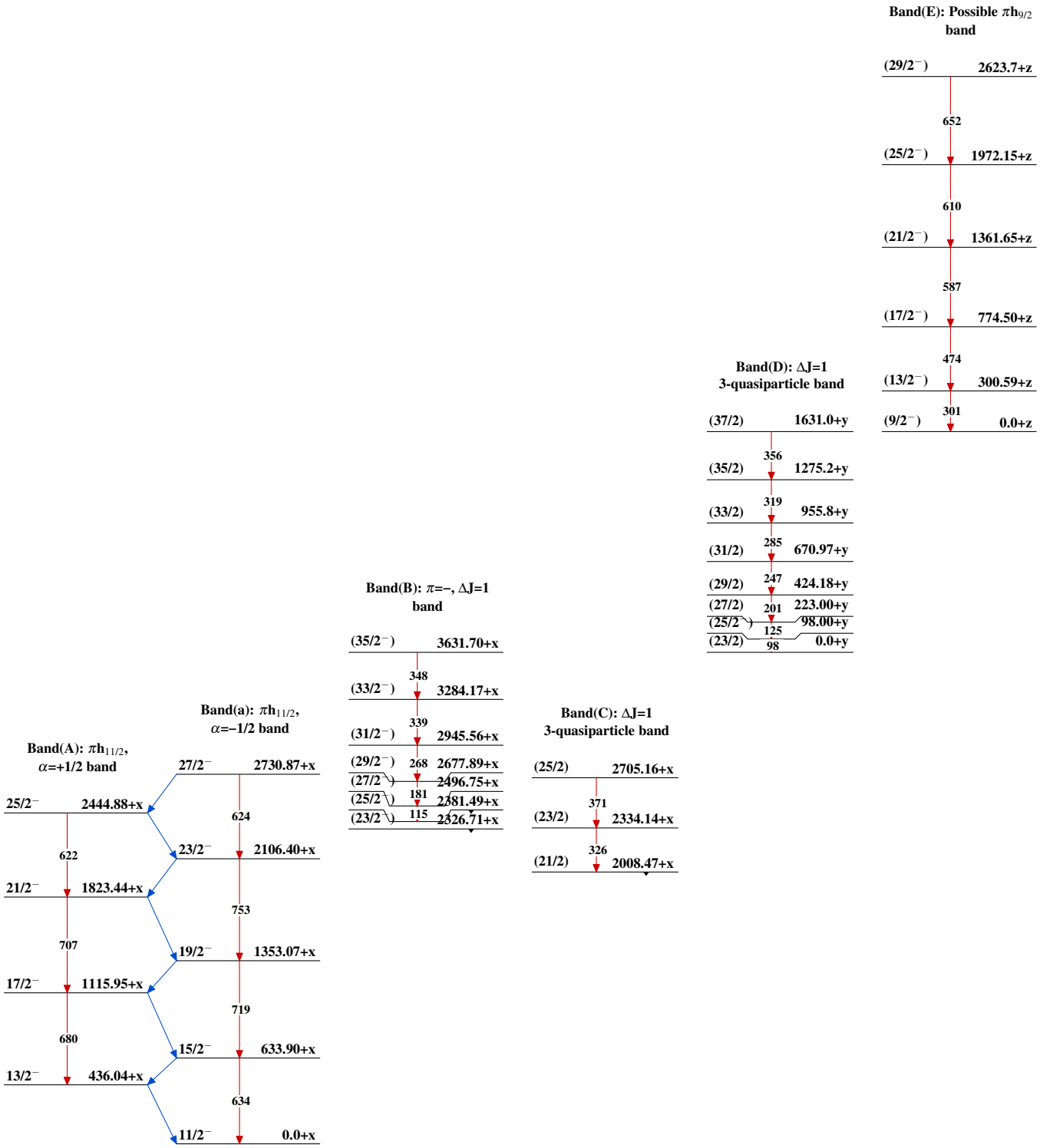
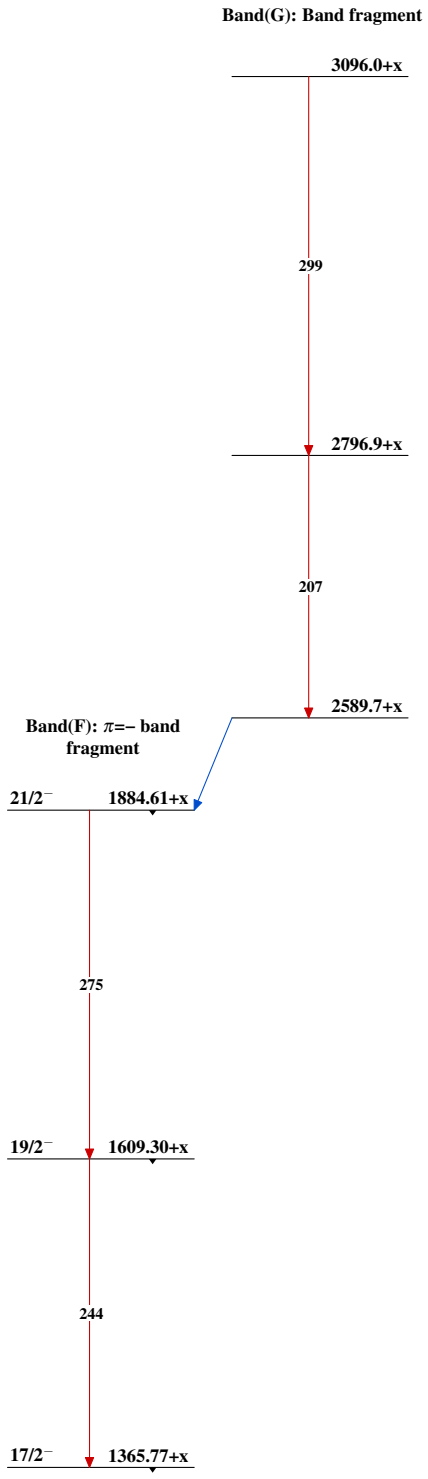


$^{171}_{77}Ir_{94}$

^{116}Sn(^{58}Ni,p2nγ) 1999Ba84 (continued)



$^{171}_{77}Ir_{94}$