^{58}Ni(^{16}O,pnγ), ^{40}Ca(^{36}Ar,3pnγ) 1982Ga06,1988Ul01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. Abriola(a), A. A. Sonzogni	NDS 111,1 (2010)	1-May-2009

Others: 1981HeZZ, 1980DaZO.
Level energies, spins and parities have not been adopted from thie dataset in this evaluation.

^{58}Ni(^{16}O,pnγ), E=40-55 MeV, Eγ, Iγ, Iγ(t), I$\gamma(\theta)$, $\gamma\gamma$ coin
.
E=50 MeV, lifetimes by RDM, deduced transition rates
E=52-65 MeV, Eγ, Iγ, nγ coin, $\gamma\gamma$ coin, n$\gamma\gamma$ coin.
^{40}Ca(^{36}Ar,3pnγ), E=125 MeV, $\gamma\gamma$ coin, DSA lineshapes (1988Ul01)

^{72}Br Levels

E(level)	J$^{\pi}$	T$_{1/2}$[†]	Comments
0	3$^+$		
100.92[#] *3*	1$^-$	10.6 s *3*	T$_{1/2}$: from Adopted Levels.
124.31 *8*	(2,3)		
131.37[‡] *14*	(2$^-$)		
162.7 *4*	1$^+$		
218.56[#] *13*	(3$^-$)		
229.83 *12*			
310.7 *3*	1$^+$		
333.53[‡] *13*	(4$^-$)	0.51 ns *12*	
370.88[‡] *16*	(4$^-$)	2.1 ns *4*	
379.24 *6*	(2$^+$)		
398.52[&] *9*	(2$^+$)	101 ps *20*	
468.82[#] *15*	(5$^-$)	0.37 ns *16*	
603.5 *4*			
659.84[‡] *14*	(6$^-$)	155 ps *16*	
668.69[&] *8*	(4$^+$)	106 ps *14*	
717.73[‡] *22*	(6$^-$)	1.7 ns *2*	
959.96[#] *21*	(7$^-$)	9.0 ps *21*	
992.19[&] *8*	(6$^+$)	85 ps *8*	
1189.53[‡] *24*	(8$^-$)	16 ps *2*	
1320.4[‡] *3*	(8$^-$)	<3.5 ps	
1345.72[&] *10*	(8$^+$)	71 ps *4*	
1449.23 *12*	(9$^+$)	59 ps *6*	
1614.3[#] *3*	(9$^-$)	<4.2 ps	
1722.4 *4*			
1991.1 *5*			
2084.7[‡] *3*	(10$^-$)	<1.4 ps	
2188.3[@] *3*	(10$^+$)	<2.1 ps	T$_{1/2}$: DSA analysis combined with RDM give 0.4<T$_{1/2}$ ≤2.1 ps (1988Ul01). Other: T$_{1/2}$<5 ps (1982Ga22).
2482.7[#] *7*	(11$^-$)		
2500.3[@] *3*	(11$^+$)		T$_{1/2}$: 0.1<T$_{1/2}$<0.7 ps by DSA analysis (1988Ul01).
3081.7[‡] *6*	(12$^-$)		
3521.1[#] *10*	(13$^-$)		
3633.3[@] *9*	(13$^+$)	0.35 ps *10*	T$_{1/2}$: by DSA analysis (1988Ul01).

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^{58}Ni(^{16}O,pnγ), ^{40}Ca(^{36}Ar,3pnγ) 1982Ga06,1988Ul01 (continued)

^{72}Br Levels (continued)

E(level)	J$^\pi$
4209.2‡ *10*	(14$^-$)
4885.3@ *13*	(15$^+$)

† By RDM from 1988Ul01, unless otherwise indicated.
‡ Band(A): negative parity, even spin band.
# Band(B): negative parity, odd spin band.
@ Band(C): positive parity, odd spin rotational band.
& Band(D): positive parity, even spin band.

γ(^{72}Br)

E$_\gamma$†	I$_\gamma$@	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.b	Comments
30.4# *3*	>164	131.37	(2$^-$)	100.92	1$^-$		I(γ+ce) estimated from the decay scheme (1982Ga06).
37.1# *3*	11	370.88	(4$^-$)	333.53	(4$^-$)		I(γ+ce) estimated from the coincidence results (1982Ga06).
86.9# *3*	96 *5*	218.56	(3$^-$)	131.37	(2$^-$)		
87.8# *3*	3.0 *9*	398.52	(2$^+$)	310.7	1$^+$		
98.0‡ *2*	13 *2*	468.82	(5$^-$)	370.88	(4$^-$)		
100.92 *3*	75.2& *16*	100.92	1$^-$	0	3$^+$	(M2)	Mult.,α: 1982Ga06 report α=0.9 to 2.5 based on intensity balance arguments. 1980DaZO report α=0.93 *9*, probably also from intensity balance arguments, but no details are given. These results allow mult=M2 (α=1.17) or mult=E2 (α=0.85). If E2, then B(E2)(W.u.)=1.5×10^{-7}, a value about three orders smaller than other reduced E2 transition probabilities in this mass region (1979En04). If M2, then B(M2)(W.u.)=7.4×10^{-6}. A possibly similar, highly retarded M2 transition has been seen in ^{76}Br decay (see 1982Ga06).
103.50 *8*	42 *4*	1449.23	(9$^+$)	1345.72	(8$^+$)	D	
114.96 *5*	26 *3*	333.53	(4$^-$)	218.56	(3$^-$)	D	
117.6 *2*	14 *3*	218.56	(3$^-$)	100.92	1$^-$		
124.28 *9*	19 *2*	124.31	(2,3)	0	3$^+$		
135.4‡ *4*	14 *2*	468.82	(5$^-$)	333.53	(4$^-$)		
152.5‡ *5*	3 *1*	370.88	(4$^-$)	218.56	(3$^-$)		
162.9‡ *5*	2.0 *7*	162.7	1$^+$	0	3$^+$		
190.8‡ *4*	2 *1*	659.84	(6$^-$)	468.82	(5$^-$)		
202.15 *9*	30[a] *3*	333.53	(4$^-$)	131.37	(2$^-$)		
229.87 *13*	12[a] *2*	229.83		0	3$^+$		
236.0 *5*	3 *1*	398.52	(2$^+$)	162.7	1$^+$		
239.57 *13*	20 *2*	370.88	(4$^-$)	131.37	(2$^-$)		
242.2 *5*	6 *2*	959.96	(7$^-$)	717.73	(6$^-$)		
248.9 *2*	48[a] *5*	717.73	(6$^-$)	468.82	(5$^-$)		
250.24 *7*	50[a] *4*	468.82	(5$^-$)	218.56	(3$^-$)		
254.8 *5*	4 *1*	379.24	(2$^+$)	124.31	(2,3)		
270.16 *4*	52[a] *2*	668.69	(4$^+$)	398.52	(2$^+$)	E2[c]	
274.1 *2*	12[a] *3*	398.52	(2$^+$)	124.31	(2,3)		

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^{58}Ni(^{16}O,pnγ), ^{40}Ca(^{36}Ar,3pnγ) 1982Ga06,1988Ul01 (continued)

γ(^{72}Br) (continued)

E_γ [†]	I_γ [@]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [b]
289.46 *8*	24[a] *2*	668.69	(4$^+$)	379.24	(2$^+$)	E2[c]
297.8[‡] *5*	2.5 *8*	668.69	(4$^+$)	370.88	(4$^-$)	
310.3 *7*	2.8 *10*	310.7	1$^+$	0	3$^+$	
312.2 *4*	8.5 *15*	2500.3	(11$^+$)	2188.3	(10$^+$)	
323.50 *2*	100[a] *2*	992.19	(6$^+$)	668.69	(4$^+$)	E2[c]
326.32 *5*	38[a] *2*	659.84	(6$^-$)	333.53	(4$^-$)	E2[c]
335.1 *2*	6 *1*	668.69	(4$^+$)	333.53	(4$^-$)	
353.53 *5*	98[a] *2*	1345.72	(8$^+$)	992.19	(6$^+$)	E2[c]
373.7 *6*	2.0 *4*	603.5		229.83		
379.25 *6*	19[a] *2*	379.24	(2$^+$)	0	3$^+$	
388.7 *5*	2.8 *6*	992.19	(6$^+$)	603.5		
398.3 *4*	39[a] *3*	398.52	(2$^+$)	0	3$^+$	
439.2 *4*	9.5 *15*	668.69	(4$^+$)	229.83		
471.80 *14*	26 *2*	1189.53	(8$^-$)	717.73	(6$^-$)	
491.14 *15*	17 *2*	959.96	(7$^-$)	468.82	(5$^-$)	
529.7 *4*	8 *2*	1189.53	(8$^-$)	659.84	(6$^-$)	
645.4 *5*	7.5 *20*	1991.1		1345.72	(8$^+$)	
654.3 *2*	18 *4*	1614.3	(9$^-$)	959.96	(7$^-$)	
660.6 *3*	18 *2*	1320.4	(8$^-$)	659.84	(6$^-$)	
669.1 *5*	8 *2*	668.69	(4$^+$)	0	3$^+$	
730.2 *4*	5.2 *10*	1722.4		992.19	(6$^+$)	
739.0[‡] *4*	4 *2*	2188.3	(10$^+$)	1449.23	(9$^+$)	
764.3[‡] *4*	15 *3*	2084.7	(10$^-$)	1320.4	(8$^-$)	
842.7 *4*	38 *4*	2188.3	(10$^+$)	1345.72	(8$^+$)	
868.4 *6*	17.5 *40*	2482.7	(11$^-$)	1614.3	(9$^-$)	
895.2[‡] *3*	30 *5*	2084.7	(10$^-$)	1189.53	(8$^-$)	
996.9[‡] *5*	20 *5*	3081.7	(12$^-$)	2084.7	(10$^-$)	
1038.4[‡] *7*	10 *4*	3521.1	(13$^-$)	2482.7	(11$^-$)	
1050.9 *4*	24 *4*	2500.3	(11$^+$)	1449.23	(9$^+$)	
1127.5[‡] *8*	12 *5*	4209.2	(14$^-$)	3081.7	(12$^-$)	
1133.0 *8*	16 *5*	3633.3	(13$^+$)	2500.3	(11$^+$)	
1252[‡] *1*	10 *4*	4885.3	(15$^+$)	3633.3	(13$^+$)	

[†] From 1988Ul01, unless noted otherwise.
[‡] From $\gamma\gamma$-coincidence spectra.
[#] From 1982Ga06.
[@] Relative intensity at 65 MeV from $\gamma\gamma$-coin spectra summed over all gating detectors (1988Ul01), except as noted.
[&] Intensity from γ-ray singles spectra at 52 MeV and θ=55°.
[a] From the neutron gated spectrum at 65 MeV and θ=63°.
[b] From $\gamma(\theta)$ in 1982Gr06, except as noted.
[c] From $\gamma(\theta)$ and RUL.

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Level Scheme

Intensities: Relative I_γ

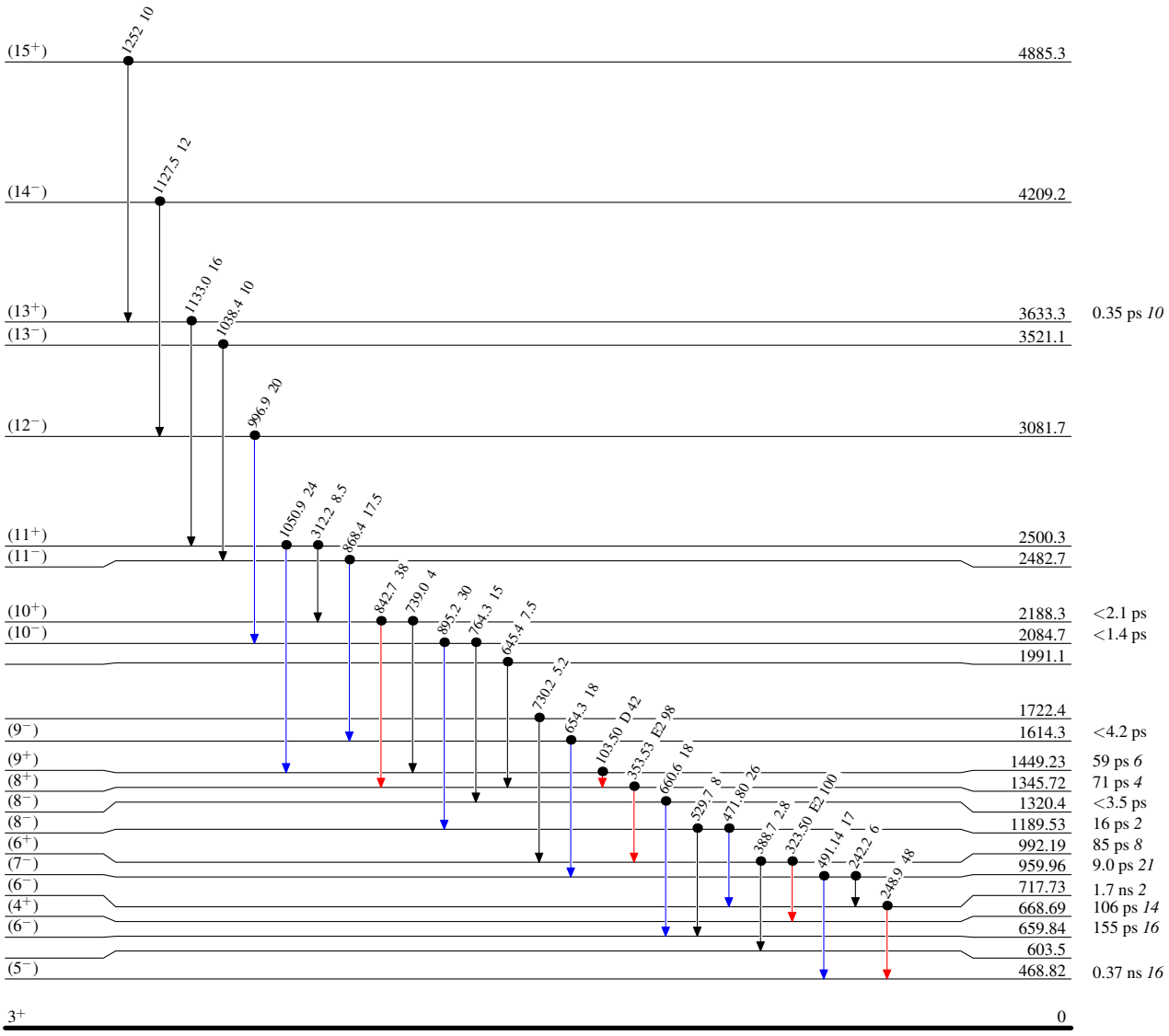
Legend

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

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

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

Coincidence



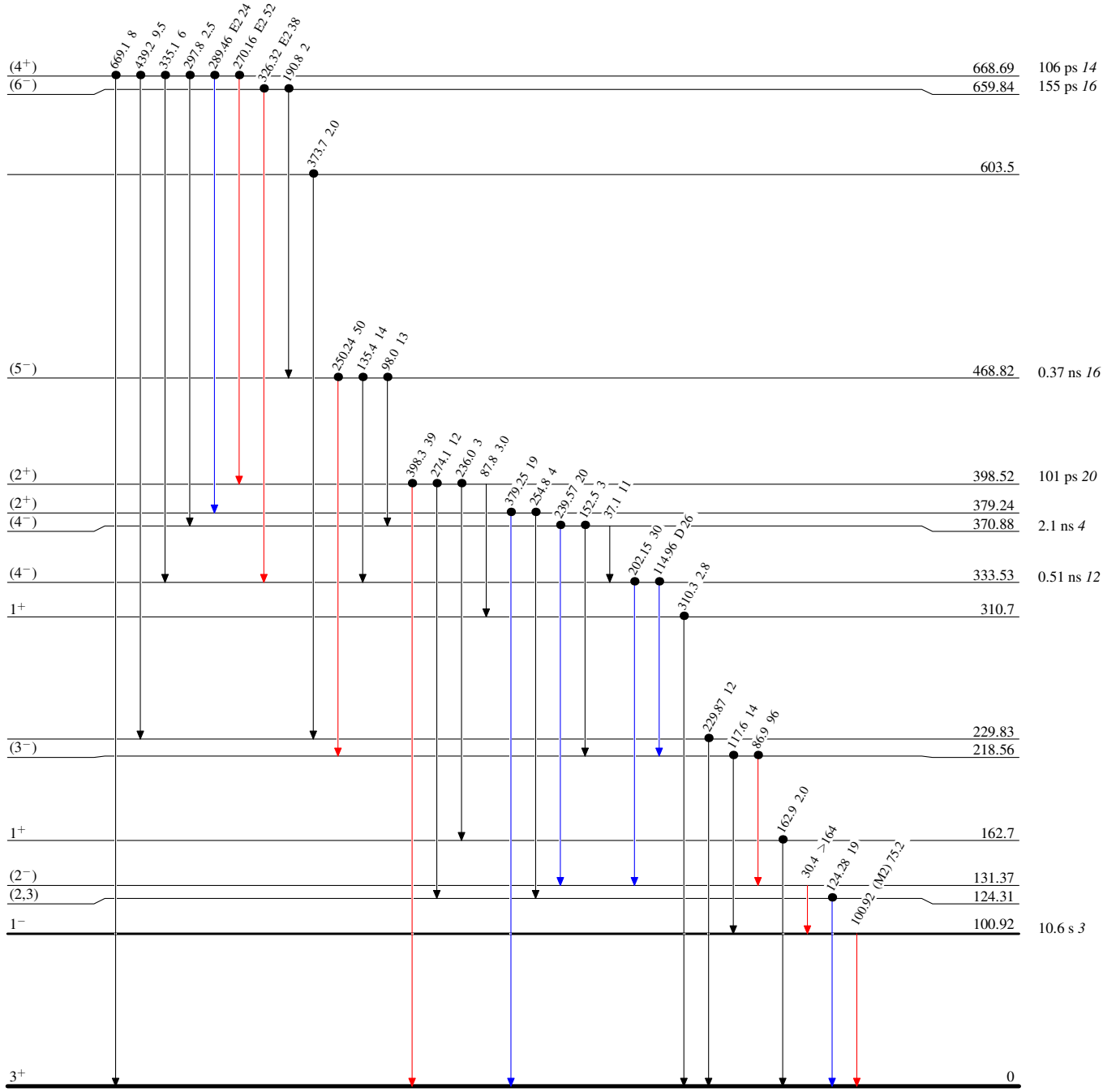
$^{72}_{35}Br_{37}$

^{58}Ni(^{16}O,pnγ), ^{40}Ca(^{36}Ar,3pnγ) 1982Ga06,1988Ul01

Level Scheme (continued)

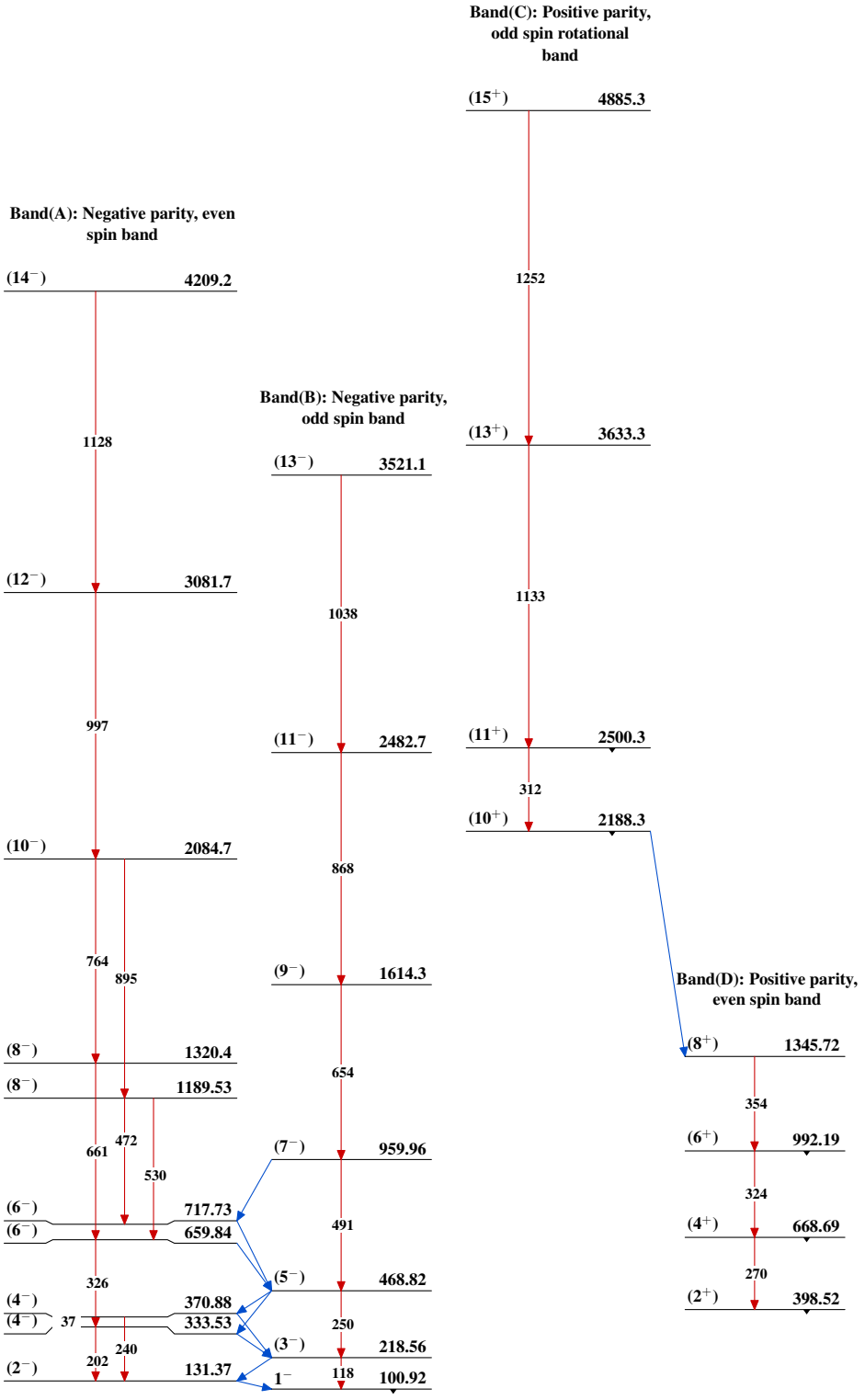
Intensities: Relative I_γ

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



$^{72}_{35}Br_{37}$

^{58}Ni(^{16}O,pnγ), ^{40}Ca(^{36}Ar,3pnγ) 1982Ga06,1988Ul01



$^{72}_{35}Br_{37}$