^{48}Ti(^{30}Si,2pnγ) 1999So02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Alexandru Negret, Balraj Singh	NDS 114, 841 (2013)	30-Jun-2013

E=90 MeV. 190 μg/cm^2 target enriched to 99%. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(DCO) using an array of 10 Compton-suppressed Ge detectors. Deduced 3- and 5-quasiparticle band structures.

^{75}Se Levels

E(level)	J$^\pi$†	E(level)	J$^\pi$†	E(level)	J$^\pi$†	E(level)	J$^\pi$†
0.0‡	5/2$^+$	1740.4# 2	(15/2$^+$)	3431.8b 8	(19/2$^-$)	5475.5‡ 5	(29/2$^+$)
112.1# 1	7/2$^+$	1904.8a 2	(13/2$^-$)	3646.1@ 2	(21/2$^-$)	5585.6b 16	(27/2$^-$)
132.4‡ 1	9/2$^+$	1910.2‡ 2	(17/2$^+$)	3745.7# 3	(23/2$^+$)	6059.1@ 11	(29/2$^-$)
286.4b 1	3/2$^-$	2390.6b 2	(15/2$^-$)	3884.4a 20	(21/2$^-$)	6171.9# 10	(31/2$^+$)
427.5a 1	5/2$^-$	2765.4# 3	(19/2$^+$)	4198.7‡ 4	(25/2$^+$)	6870.1‡ 17	(33/2$^+$)
747.3b 1	7/2$^-$	2840.1@ 2	(17/2$^-$)	4267.6& 11	(23/2$^-$)	7649.3@ 15	(33/2$^-$)
813.8# 2	11/2$^+$	2871.4a 2	(17/2$^-$)	4471.9b 13	(23/2$^-$)	7755.3# 20	(35/2$^+$)
933.4‡ 1	13/2$^+$	3017.8‡ 3	(21/2$^+$)	4706.4@ 3	(25/2$^-$)	8447.6‡ 25	(37/2$^+$)
1078.3a 2	9/2$^-$	3289.1& 7	(19/2$^-$)	4830.7# 5	(27/2$^+$)	10242.6‡ 32	(41/2$^+$)
1487.2b 2	(11/2$^-$)	3305.6 2	(19/2$^-$)	5037.2?a 23	(25/2$^-$)		

† As proposed by 1999So02. The parentheses are added by the evaluator since strong arguments for most of these assignments are lacking.
‡ Band(A): $\nu g_{9/2}$ 5/2[422], α=+1/2. First band crossing is due to a pair of $g_{9/2}$ protons and the second due to alignment of a pair of $g_{9/2}$ neutrons.
# Band(a): $\nu g_{9/2}$ 5/2[422], α=−1/2.
@ Band(B): (ν1/2[431])(π3/2[312])(π1/2[440]), α=+1/2.
& Band(b): (ν1/2[431])(π3/2[312])(π1/2[440]), α=−1/2.
a Band(C): α=+1/2.
b Band(c): α=−1/2.

γ(^{75}Se)

The R(DCO) presented as comments are from 1999So02. The first value corresponds to a gate on stretched quadrupole (E2) transitions (theoretical R(DCO)=0.74 for ΔJ=1 transitions and 0.7 otherwise) while the second value corresponds to a gate on a stretched dipole transition (theoretical R(DCO)=1.41 for ΔJ=2, Q transitions and 0.70 for ΔJ=1, dipole).

E$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$
112.1† 1	112.1	7/2$^+$	0.0	5/2$^+$
119.4† 2	933.4	13/2$^+$	813.8	11/2$^+$
132.4† 1	132.4	9/2$^+$	0.0	5/2$^+$
141.2† 2	427.5	5/2$^-$	286.4	3/2$^-$
169.8† 3	1910.2	(17/2$^+$)	1740.4	(15/2$^+$)
252.7† 5	3017.8	(21/2$^+$)	2765.4	(19/2$^+$)
286.4†	286.4	3/2$^-$	0.0	5/2$^+$
315.4† 1	427.5	5/2$^-$	112.1	7/2$^+$
319.7† 1	747.3	7/2$^-$	427.5	5/2$^-$

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^{48}Ti(^{30}Si,2pnγ) 1999So02 (continued)

$\gamma(^{75}Se)$ (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Comments
330.8† *2*		1078.3	$9/2^-$	747.3	$7/2^-$	
340.4 *1*	9	3646.1	$(21/2^-)$	3305.6	$(19/2^-)$	R(DCO)=0.52 *9*, 0.68 *6*.
357.2 *10*	4	3646.1	$(21/2^-)$	3289.1	$(19/2^-)$	R(DCO)=0.81 *11*.
408.9† *1*		1487.2	$(11/2^-)$	1078.3	$9/2^-$	
417.6† *1*		1904.8	$(13/2^-)$	1487.2	$(11/2^-)$	
427.6†		427.5	$5/2^-$	0.0	$5/2^+$	
439.0 *20*	2	4706.4	$(25/2^-)$	4267.6	$(23/2^-)$	R(DCO)=0.93 *12*.
449.6 *1*	8	2840.1	$(17/2^-)$	2390.6	$(15/2^-)$	R(DCO)=0.77 *15*, 0.77 *6*.
453.2† *7*		4198.7	$(25/2^+)$	3745.7	$(23/2^+)$	
460.9† *3*		747.3	$7/2^-$	286.4	$3/2^-$	
465.4 *1*	8	3305.6	$(19/2^-)$	2840.1	$(17/2^-)$	R(DCO)=0.56 *9*, 0.70 *8*.
485.7† *7*		2390.6	$(15/2^-)$	1904.8	$(13/2^-)$	
560.7 *10*	2	3431.8	$(19/2^-)$	2871.4	$(17/2^-)$	R(DCO)=0.36 *11*, 0.72 *16*.
631.6† *4*		4830.7	$(27/2^+)$	4198.7	$(25/2^+)$	
644.2 *10*	4	5475.5	$(29/2^+)$	4830.7	$(27/2^+)$	R(DCO)=0.56 *6*.
650.8† *1*		1078.3	$9/2^-$	427.5	$5/2^-$	
681.1† *2*		813.8	$11/2^+$	132.4	$9/2^+$	
696.5 *10*	3	6171.9	$(31/2^+)$	5475.5	$(29/2^+)$	R(DCO)=0.55 *7*.
701.7† *3*		813.8	$11/2^+$	112.1	$7/2^+$	
727.9† *1*		3745.7	$(23/2^+)$	3017.8	$(21/2^+)$	
739.9† *2*		1487.2	$(11/2^-)$	747.3	$7/2^-$	
774.6 *10*	2	3646.1	$(21/2^-)$	2871.4	$(17/2^-)$	R(DCO)=0.80 *20*.
801.1† *1*		933.4	$13/2^+$	132.4	$9/2^+$	
806.1 *1*	9	3646.1	$(21/2^-)$	2840.1	$(17/2^-)$	R(DCO)=0.98 *8*, 1.37 *12*.
806.9† *2*		1740.4	$(15/2^+)$	933.4	$13/2^+$	
826.5† *1*		1904.8	$(13/2^-)$	1078.3	$9/2^-$	
855.2† *1*		2765.4	$(19/2^+)$	1910.2	$(17/2^+)$	
898.8 *10*	14	3289.1	$(19/2^-)$	2390.6	$(15/2^-)$	R(DCO)=1.68 *24*.
903.5† *1*		2390.6	$(15/2^-)$	1487.2	$(11/2^-)$	
915‡ *1*	1	3305.6	$(19/2^-)$	2390.6	$(15/2^-)$	R(DCO)=1.7 *5*.
926.6† *1*		1740.4	$(15/2^+)$	813.8	$11/2^+$	
935.1 *1*	12	2840.1	$(17/2^-)$	1904.8	$(13/2^-)$	R(DCO)=1.02 *15*, 1.53 *15*.
966.6 *2*	8	2871.4	$(17/2^-)$	1904.8	$(13/2^-)$	R(DCO)=1.08 *10*, 1.67 *19*.
976.8† *3*		1910.2	$(17/2^+)$	933.4	$13/2^+$	
978.5 *10*	4	4267.6	$(23/2^-)$	3289.1	$(19/2^-)$	R(DCO)=1.37 *13*.
980.3† *4*		3745.7	$(23/2^+)$	2765.4	$(19/2^+)$	
1013.0 *20*	3	3884.4	$(21/2^-)$	2871.4	$(17/2^-)$	R(DCO)=1.47 *22*.
1024.8† *7*		2765.4	$(19/2^+)$	1740.4	$(15/2^+)$	
1040.1 *10*	4	4471.9	$(23/2^-)$	3431.8	$(19/2^-)$	R(DCO)=0.96 *24* for 1040.1+1040.8.
1040.8 *10*	5	3431.8	$(19/2^-)$	2390.6	$(15/2^-)$	R(DCO)=0.96 *24* for 1040.8+1040.1.
1060.3 *2*	5	4706.4	$(25/2^-)$	3646.1	$(21/2^-)$	R(DCO)=1.1 *3*, 1.52 *24*.
1085.6† *5*		4830.7	$(27/2^+)$	3745.7	$(23/2^+)$	
1107.6† *2*		3017.8	$(21/2^+)$	1910.2	$(17/2^+)$	
1113.7 *10*	2	5585.6	$(27/2^-)$	4471.9	$(23/2^-)$	
1152.8‡ *10*	1	5037.2?	$(25/2^-)$	3884.4	$(21/2^-)$	
1180.7† *2*		4198.7	$(25/2^+)$	3017.8	$(21/2^+)$	
1276.9 *4*	10	5475.5	$(29/2^+)$	4198.7	$(25/2^+)$	R(DCO)=0.92 *8*.
1341.1 *10*	10	6171.9	$(31/2^+)$	4830.7	$(27/2^+)$	R(DCO)=1.03 *14*.
1352.7 *10*	4	6059.1	$(29/2^-)$	4706.4	$(25/2^-)$	R(DCO)=1.42 *19*.

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^{48}Ti(^{30}Si,2pnγ) 1999So02 (continued)

γ(^{75}Se) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Comments
[x]1369						In $\gamma\gamma$ coin with transitions from many negative parity states.
1394.6 *16*	6	6870.1	(33/2$^+$)	5475.5	(29/2$^+$)	R(DCO)=1.06 *10*.
[x]1424						In $\gamma\gamma$ coin with yrast decays up to 25/2$^+$ level at 4198.7, but a similar line is also present in ^{75}Br.
1577.5 *18*	3	8447.6	(37/2$^+$)	6870.1	(33/2$^+$)	R(DCO)=0.95 *13* for 1578γ+1583γ.
1583.4 *18*	5	7755.3	(35/2$^+$)	6171.9	(31/2$^+$)	R(DCO)=0.95 *13* for 1583γ+1578γ.
1590.2 *10*	2	7649.3	(33/2$^-$)	6059.1	(29/2$^-$)	R(DCO)=1.7 *3*.
1795.0 *20*	2	10242.6	(41/2$^+$)	8447.6	(37/2$^+$)	

† From ^{59}Co(^{19}F,2pnγ) (1992Jo04).
‡ Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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Level Scheme

Intensities: Relative I_γ

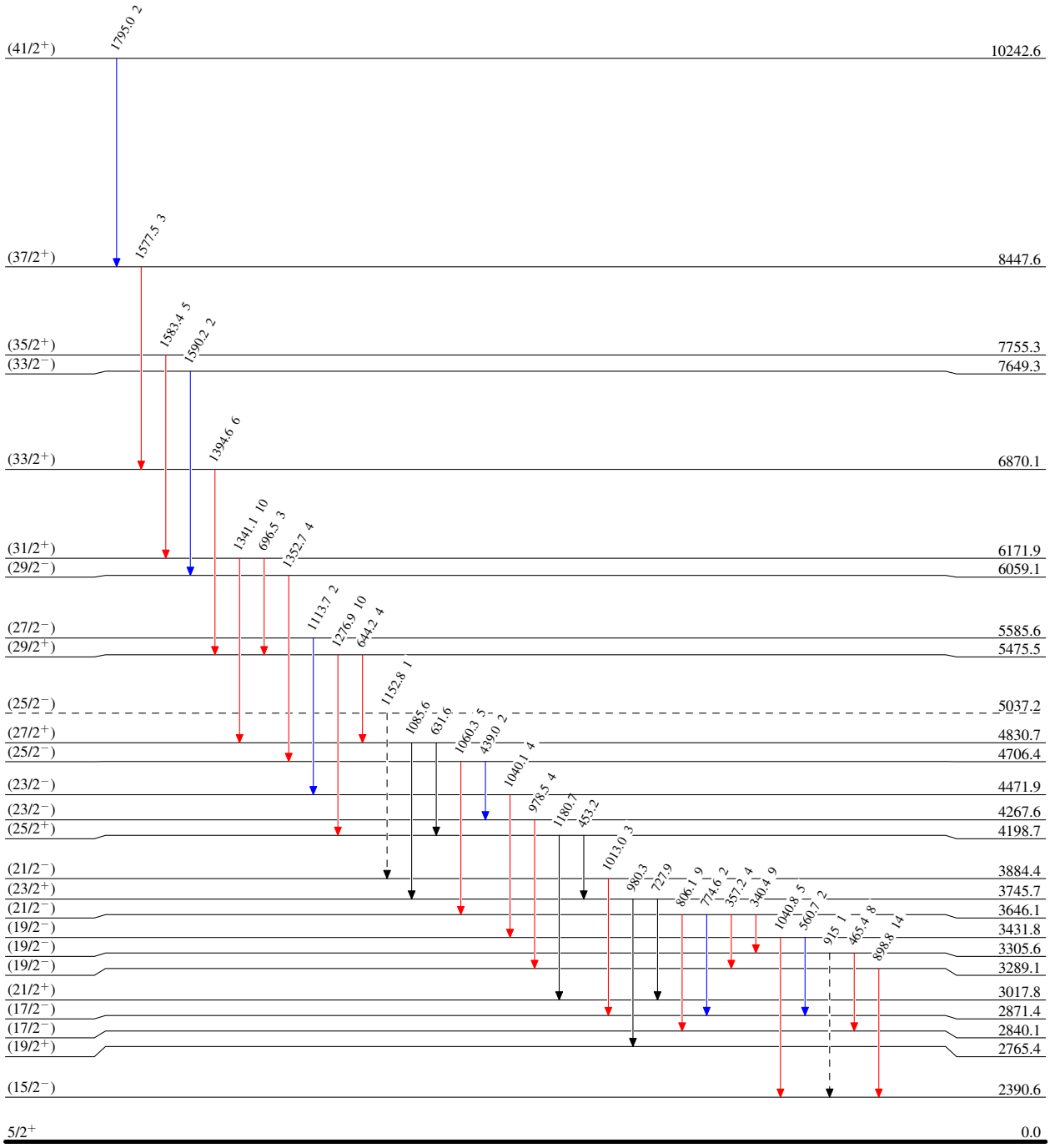
Legend

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

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

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

γ Decay (Uncertain)



$^{75}_{34}Se_{41}$

^{48}Ti(^{30}Si,2pnγ) 1999So02

Level Scheme (continued)

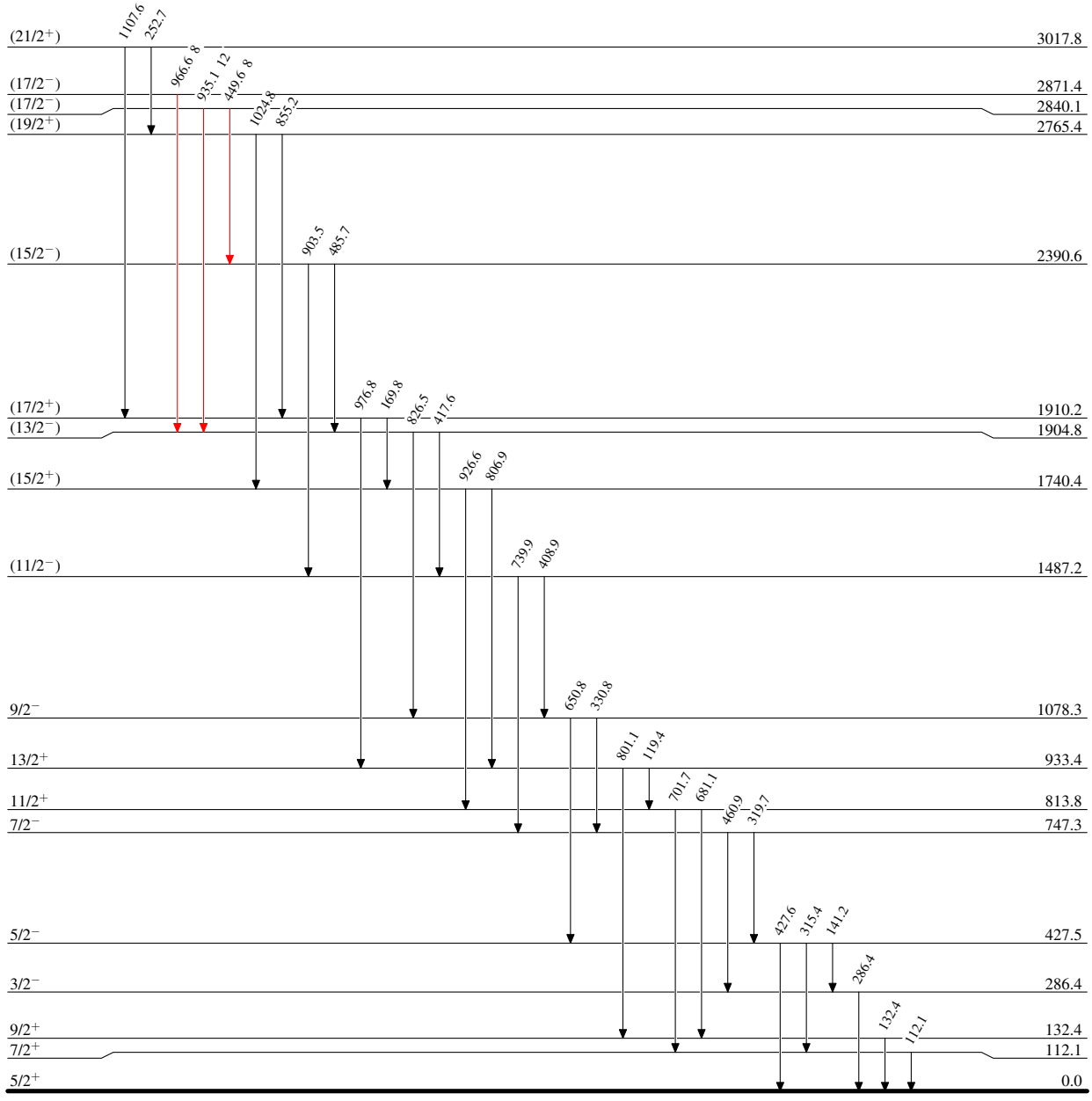
Intensities: Relative I_γ

Legend

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

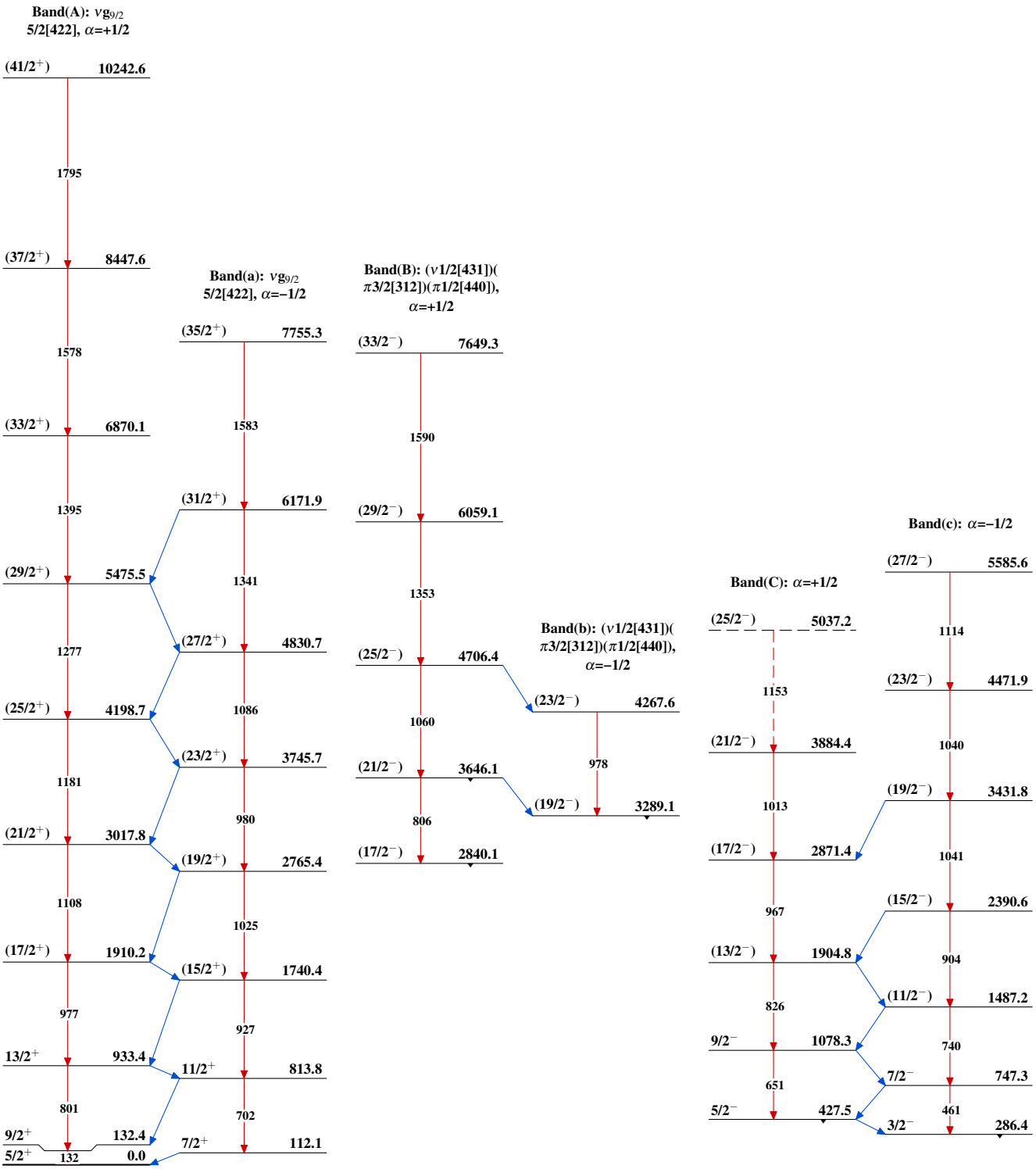
$I_\gamma < 10\% \times I_\gamma^{max}$

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



$^{75}_{34}Se_{41}$

^{48}Ti(^{30}Si,2pnγ) 1999So02



$^{75}_{34}Se_{41}$