(HI,xnγ) 2001We11

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 111, 2425 (2010)	1-Aug-2009

2001We11: ^{40}Ca(^{32}S,α3pγ), E=140 MeV. Measured Eγ, Iγ, γγ, γ(θ) and γγ(θ)(DCO) using GASP spectrometer comprised of 40 Compton-suppressed large volume Ge detector and an 80 segment BGO multiplicity filter.

1999Da10: ^{12}C(^{58}Ni,αpγ), E=261 MeV. Measured Eγ, Iγ, γγ, γγ(θ)(DCO) using NORDBALL array with 15 Compton-suppressed Ge detectors.

1991Zh28: ^{45}Ti(^{25}Mg,3p3n), E=68 MeV; measured Eγ, Iγ, γγ, γ(θ).

1980Ka08: ^{58}Ni(^{12}C,αpγ), E=39 MeV; measured Eγ, Iγ, γγ coincidences, γ(θ) and directional correlation orientation (DCO) ratios; also, ^{60}Ni(^{7}Li,2nγ), E=18-21 (mostly 20) MeV; measured Eγ, Iγ, γ excitation functions and γ(θ).

1976AlYZ: ^{54}Fe(^{14}N,n2pγ), E=36 MeV, and ^{58}Ni(^{12}C,αpγ), E=36 MeV; measured $T_{1/2}$ by recoil-distance method.

1975ChYJ: ^{54}Fe(^{12}C,pγ), ^{56}Fe(^{12}C,2npγ), ^{56}Fe(^{14}N,αnγ); beam energies not given; measured Eγ, γγ coincidences, γ yields and γ(θ).

Other: 1980MuZV: ^{40}Ca(^{28}Si,3pγ).

All data are from 2001We11 generally in agreement with earlier level schemes of 1999Da10 and 1980Ka08 or 1991Zh28 with some exceptions. The following levels reported by 1980Ka08 are not reported by 1999Da10 nor 2001We11: 1326.0, 1370.7, 1521.3, 3071.4, 4132.2, 4919, 5022, 5643, 5923, 6146, 6536, 7040, 8613. The following levels are reported by 1999Da10 but not confirmed by 2001We11: 2466.9, 3173.0, 3735.5, 4738.6, 5714.0, 6135.7, 6523.2.

^{65}Ga Levels

E(level)[†]	Jπ	Comments
0.0	3/2⁻	
190.77 *8*	5/2⁻	
808.95 *16*		
1075.33 *8*	7/2⁻	
1286.99 *11*	9/2⁻	
1353.00 *13*		
2037.72 *10*	9/2⁺	
2788.51 *13*	13/2⁻	
2813.49 *12*	11/2(+)	
3064.64 *12*	13/2⁺	
3732.81 *12*	15/2(+)	
3910.07 *14*	15/2(+)	
4122.85 *13*	17/2⁺	
4330.75 *13*	17/2⁺	
4433.66 *13*	17/2⁺	
4547.15 *13*	19/2(+)	
4632.90 *14*	17/2⁺	
4850.22 *15*	17/2⁺	
5467.16[#] *14*	19/2(−)	Jπ: 19/2⁻ In table 2 of 2001We11.
5497.91 *13*	21/2⁺	
5917.39[&] *14*	21/2⁺	
5944.87[‡] *15*	21/2(−)	
6121.37 *17*		
6295.22[#] *14*	23/2(−)	Jπ: 23/2⁻ In table 2 of 2001We11.
6816.68[&] *14*	25/2⁺	
7089.64[‡] *17*	25/2(−)	
7363.07[#] *17*	27/2(−)	Jπ: 27/2⁻ In table 2 of 2001We11.
7941.88[&] *17*	29/2⁺	
8199.41[a] *17*	(27/2⁺)	
8498.82[‡] *19*	29/2(−)	

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(HI,xnγ) 2001We11 (continued)

^{65}Ga Levels (continued)

E(level)[†]	Jπ	Comments
8605.18[#] *20*	31/2(−)	Jπ: 31/2− In table 2 of 2001We11.
9331.91[&] *18*	33/2+	
9402.33[a] *17*	(31/2+)	
10169.1[#] *3*		
10192.4[‡] *3*		
10508.1[@] *4*		
10977.60[a] *19*	(35/2+)	
11069.12[&] *20*	37/2+	E(level): 11067.5 In table 2 of 2001We11 deviates by 1.5 keV.
12188.6[@] *4*		
12790.63[a] *20*	(39/2+)	
13238.7[&] *3*	41/2+	E(level): 13236.9 In table 2 of 2001We11 deviates by 1.8 keV.
14025.0[@] *4*		
15043.5[a] *3*	(43/2+)	
15981.1[@] *4*		

† Deduced by evaluators from least-squares fit to γ-ray energies.
‡ Band(A): band based on 21/2(−).
# Band(B): band based on 19/2(−).
@ Band(C): γ sequence.
& Band(D): band based on 21/2+.
a Band(E): band based on (27/2+).

γ(^{65}Ga)

R=Angular distribution from oriented states,≈1.1 for stretched Q and≈0.6 for stretched D.
With gate set on stretched Q, DCO ratios≈1 for stretched Q and≈0.5 for stretched D.

Eγ[#]	Iγ[#]	Ei(level)	Jiπ	Ef	Jfπ	Mult.[†]	Comments
190.8 *1*	100 *3*	190.77	5/2−	0.0	3/2−	D	DCO=0.82 *2*. R=0.68 *1*.
216.4 *1*	1.2 *1*	4547.15	19/2(+)	4330.75	17/2+		
310.8 *1*	9.5 *3*	4433.66	17/2+	4122.85	17/2+		DCO=1.22 *6*. R=1.15 *3*. Mult.: stretch Q not consistent with placement.
350.5 *1*	1.0 *1*	6295.22	23/2(−)	5944.87	21/2(−)		
419.6 *1*	3.1 *1*	5917.39	21/2+	5497.91	21/2+		
420.7 *1*	2.6 *1*	4330.75	17/2+	3910.07	15/2(+)	D+Q	R=0.79 *4*.
424.2 *1*	1.3 *1*	4547.15	19/2(+)	4122.85	17/2+		
521.6 *1*	2.2 *1*	6816.68	25/2+	6295.22	23/2(−)		
544.4 *2*	0.5 *1*	1353.00		808.95			
597.9 *1*	4.6 *1*	4330.75	17/2+	3732.81	15/2(+)	Q	
616.9 *1*	3.8 *1*	5467.16	19/2(−)	4850.22	17/2+	D	R=0.50 *3*.
668.3 *1*	5.1 *2*	3732.81	15/2(+)	3064.64	13/2+	D	R=0.68 *4*.
684.8 *1*	0.8 *1*	2037.72	9/2+	1353.00			
700.7 *1*	2.2 *1*	4433.66	17/2+	3732.81	15/2(+)	D	R=0.51 *5*.
727.3 *1*	3.1 *1*	4850.22	17/2+	4122.85	17/2+		R=1.10 *6*. Mult.: stretch Q not consistent with placement.

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(HI,xnγ) 2001We11 (continued)

γ(^{65}Ga) (continued)

E_γ[#]	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
750.9 *1*	73.4 *22*	2037.72	9/2$^+$	1286.99	9/2$^-$	Q	DCO=1.16 *5*. R=1.08 *2*. Mult.: not consistent with J^π.
775.7 *2*	0.8 *1*	2813.49	11/2$^{(+)}$	2037.72	9/2$^+$		
797.3 *1*	7.1 *2*	6295.22	23/2$^{(-)}$	5497.91	21/2$^+$	D	R=0.70 *3*.
809.3 *2*	1.0 *2*	808.95		0.0	3/2$^-$		
814.4 *1*	14.1 *4*	4547.15	19/2$^{(+)}$	3732.81	15/2$^{(+)}$	Q	DCO=1.17 *8*. R=1.21 *4*.
828.0 *1*	15.3 *5*	6295.22	23/2$^{(-)}$	5467.16	19/2$^{(-)}$	Q	DCO=0.95 *6*. R=1.00 *3*.
834.4 *2*	0.6 *1*	5467.16	19/2$^{(-)}$	4632.90	17/2$^+$		
884.6 *1*	9.7 *3*	1075.33	7/2$^-$	190.77	5/2$^-$	D+Q	R=0.75 *4*.
899.4 *1*	33.7 *10*	6816.68	25/2$^+$	5917.39	21/2$^+$	Q	DCO=1.31 *6*. R=1.35 *3*.
919.1 *1*	2.6 *1*	3732.81	15/2$^{(+)}$	2813.49	11/2$^{(+)}$	Q	R=1.05 *6*.
919.2[‡] *2*	0.9 *1*	5467.16	19/2$^{(-)}$	4547.15	19/2$^{(+)}$		E_γ: level energy difference=920.0.
944.3 *1*	17.8 *5*	3732.81	15/2$^{(+)}$	2788.51	13/2$^-$	D	DCO=0.60 *3*. R=0.69 *2*.
962.3 *1*	14.5 *4*	2037.72	9/2$^+$	1075.33	7/2$^-$	D	DCO=0.67 *4*. R=0.68 *2*.
1027.1 *1*	86 *3*	3064.64	13/2$^+$	2037.72	9/2$^+$	Q	DCO=1.28 *8*. R=1.23 *4*.
1033.4 *1*	7.1 *2*	5467.16	19/2$^{(-)}$	4433.66	17/2$^+$	D	DCO=0.64 *4*. R=0.67 *3*.
1057.9[‡] *1*	65.9 *20*	4122.85	17/2$^+$	3064.64	13/2$^+$	Q	E_γ: level energy difference=1058.2. DCO=1.12 *4*. R=1.13 *2*.
1063.7 *2*	2.1 *1*	5497.91	21/2$^+$	4433.66	17/2$^+$		
1067.8 *1*	18.2 *6*	7363.07	27/2$^{(-)}$	6295.22	23/2$^{(-)}$	Q	DCO=0.82 *6*. R=1.24 *5*.
1075.2 *1*	9.6 *4*	1075.33	7/2$^-$	0.0	3/2$^-$	Q	R=1.09 *5*.
1096.2 *1*	94 *3*	1286.99	9/2$^-$	190.77	5/2$^-$	Q	DCO=0.77 *4*. R=0.94 *2*.
1096.6 *1*	6.2 *3*	3910.07	15/2$^{(+)}$	2813.49	11/2$^{(+)}$		
1125.2 *1*	48.6 *15*	7941.88	29/2$^+$	6816.68	25/2$^+$	Q	DCO=1.14 *4*. R=1.29 *3*.
1135.6 *2*	1.3 *1*	8498.82	29/2$^{(-)}$	7363.07	27/2$^{(-)}$		
1136.1 *2*	1.8 *1*	5467.16	19/2$^{(-)}$	4330.75	17/2$^+$		
1144.8 *1*	2.6 *1*	7089.64	25/2$^{(-)}$	5944.87	21/2$^{(-)}$	Q	R=1.27 *8*.
1167.1 *1*	8.6 *3*	5497.91	21/2$^+$	4330.75	17/2$^+$	Q	R=0.97 *6*.
1202.9 *1*	2.3 *1*	9402.33	(31/2$^+$)	8199.41	(27/2$^+$)		
1242.1 *1*	7.7 *2*	8605.18	31/2$^{(-)}$	7363.07	27/2$^{(-)}$	Q	R=1.13 *4*.
1266.0 *1*	7.7 *2*	4330.75	17/2$^+$	3064.64	13/2$^+$		DCO=0.92 *9*. R=1.18 *7*.
1284.7 *1*	4.1 *1*	5917.39	21/2$^+$	4632.90	17/2$^+$	Q	R=1.18 *10*.
1318.5 *1*	19.1 *6*	6816.68	25/2$^+$	5497.91	21/2$^+$	Q	DCO=1.01 *10*. R=1.29 *8*.
1344.6[‡] *1*	5.9 *2*	5467.16	19/2$^{(-)}$	4122.85	17/2$^+$	D	E_γ: level energy difference=1344.3. R=0.56 *2*.
1352.9 *4*	0.9 *1*	1353.00		0.0	3/2$^-$		
1369.2 *1*	3.2 *1*	4433.66	17/2$^+$	3064.64	13/2$^+$	Q	R=1.39 *11*.
1375.1 *1*	17.5 *5*	5497.91	21/2$^+$	4122.85	17/2$^+$	Q	DCO=1.03 *5*. R=1.04 *3*.
1382.7 *1*	5.2 *1*	8199.41	(27/2$^+$)	6816.68	25/2$^+$		

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(HI,xnγ) 2001We11 (continued)

γ(^{65}Ga) (continued)

E_γ[#]	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
1390.0 *1*	35.0 *11*	9331.91	$33/2^+$	7941.88	$29/2^+$	Q	DCO=1.10 *4*. R=1.24 *3*.
1397.9 *1*	6.6 *2*	5944.87	$21/2^{(-)}$	4547.15	$19/2^{(+)}$	Q	R=0.61 *2*.
1409.2 *1*	1.4 *1*	8498.82	$29/2^{(-)}$	7089.64	$25/2^{(-)}$	Q	R=1.25 *9*.
1460.5 *1*	2.9 *1*	9402.33	$(31/2^+)$	7941.88	$29/2^+$		
1484.0 *1*	3.4 *1*	5917.39	$21/2^+$	4433.66	$17/2^+$		
1501.5 *1*	17.2 *5*	2788.51	$13/2^-$	1286.99	$9/2^-$	Q	DCO=0.94 *9*. R=1.04 *5*.
1526.3 *1*	6.8 *2*	2813.49	$11/2^{(+)}$	1286.99	$9/2^-$	D	R=0.66 *3*.
1563.9 *2*	1.4 *1*	10169.1		8605.18	$31/2^{(-)}$		
1568.5 *1*	5.5 *2*	4632.90	$17/2^+$	3064.64	$13/2^+$	Q	R=1.18 *6*.
1574.2 *1*	2.9 *1*	6121.37		4547.15	$19/2^{(+)}$		
1575.3 *1*	3.1 *1*	10977.60	$(35/2^+)$	9402.33	$(31/2^+)$		
1589.6[@] *4*	0.4 *1*	10192.4		8605.18	$31/2^{(-)}$		
1644.9[‡] *1*	1.6 *1*	10977.60	$(35/2^+)$	9331.91	$33/2^+$	(D+Q)	E_γ: level energy difference=1645.7. R=0.36 *3*.
1680.4 *2*	1.3 *2*	12188.6		10508.1			
1693.6 *2*	1.4 *1*	10192.4		8498.82	$29/2^{(-)}$		
1724.6[‡] *2*	1.4 *1*	12790.63	$(39/2^+)$	11069.12	$37/2^+$		E_γ: level energy difference=1721.5.
1737.9[‡] *1*	20.0 *6*	11069.12	$37/2^+$	9331.91	$33/2^+$	Q	E_γ: level energy difference=1737.2. DCO=1.01 *4*. R=1.31 *3*.
1785.8 *3*	0.7 *1*	4850.22	$17/2^+$	3064.64	$13/2^+$		
1794.0[‡] *1*	19.6 *6*	5917.39	$21/2^+$	4122.85	$17/2^+$	Q	E_γ: level energy difference=1794.5. DCO=0.84 *5*. R=1.17 *3*.
1804.2 *3*	0.7 *1*	15043.5	$(43/2^+)$	13238.7	$41/2^+$		
1812.3[‡] *1*	2.9 *1*	12790.63	$(39/2^+)$	10977.60	$(35/2^+)$		E_γ: level energy difference=1813.0.
1836.3 *2*	0.9 *2*	14025.0		12188.6			
1956.2 *2*	1.4 *2*	15981.1		14025.0			
2169.2 *2*	5.7 *2*	13238.7	$41/2^+$	11069.12	$37/2^+$	Q	DCO=1.25 *9*. R=1.32 *5*.
2253.5 *3*	1.5 *2*	15043.5	$(43/2^+)$	12790.63	$(39/2^+)$		
2565.3 *5*	0.8 *3*	10508.1		7941.88	$29/2^+$		
2741.5 *9*	0.2 *2*	15981.1		13238.7	$41/2^+$		
2857.3 *5*	0.7 *4*	12188.6		9331.91	$33/2^+$		
2956.2 *5*	0.6 *4*	14025.0		11069.12	$37/2^+$		

[†] By evaluators based on authors' J^π assignment, DCO, ADO.
[‡] Poor fit, Eγ differs by 3 or more σ's from level energy difference.
[#] From 2001We11.
[@] Placement of transition in the level scheme is uncertain.

(HI,xnγ) 2001We11

Level Scheme

Intensities: Relative I_γ

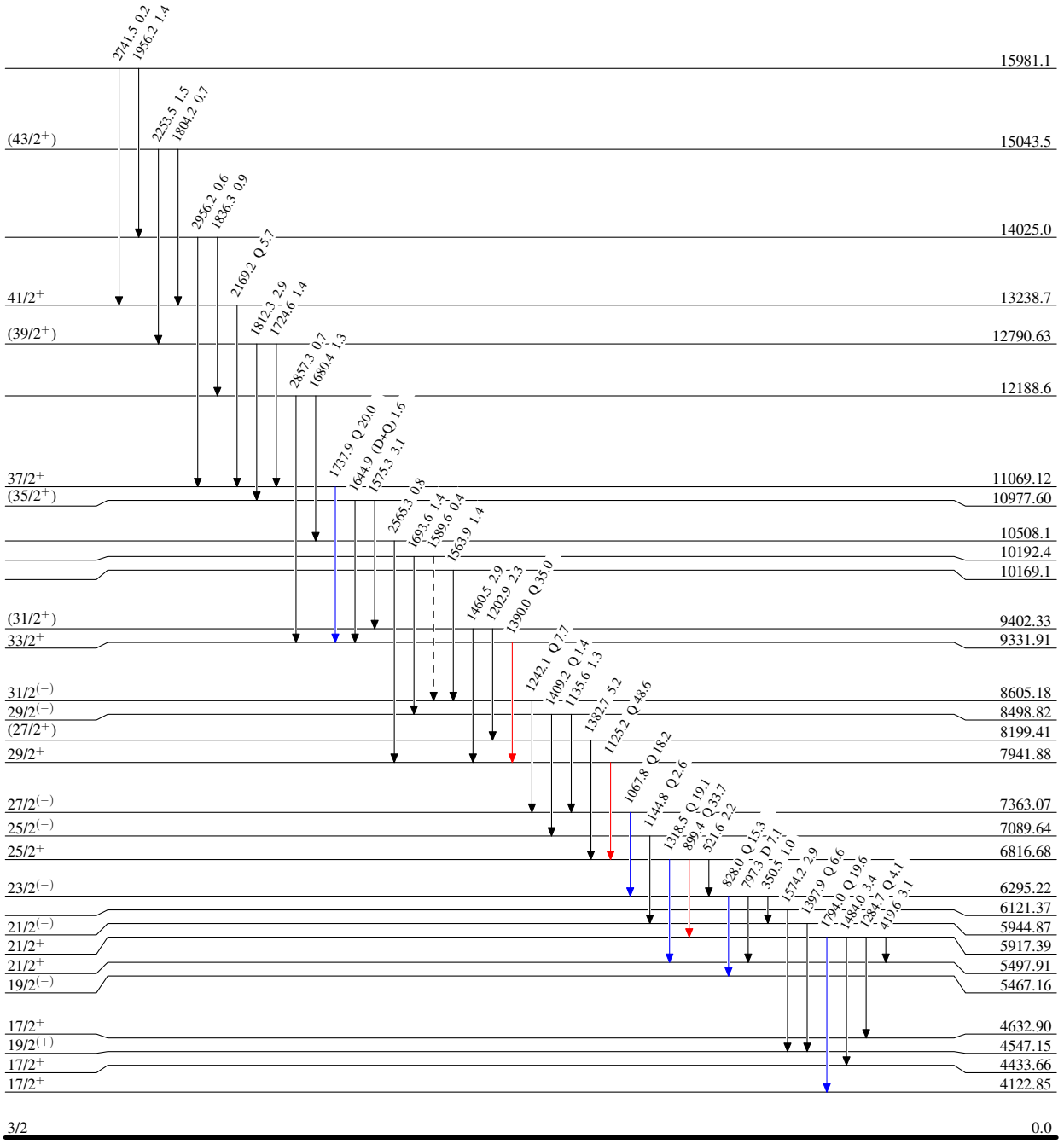
Legend

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

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

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

γ Decay (Uncertain)

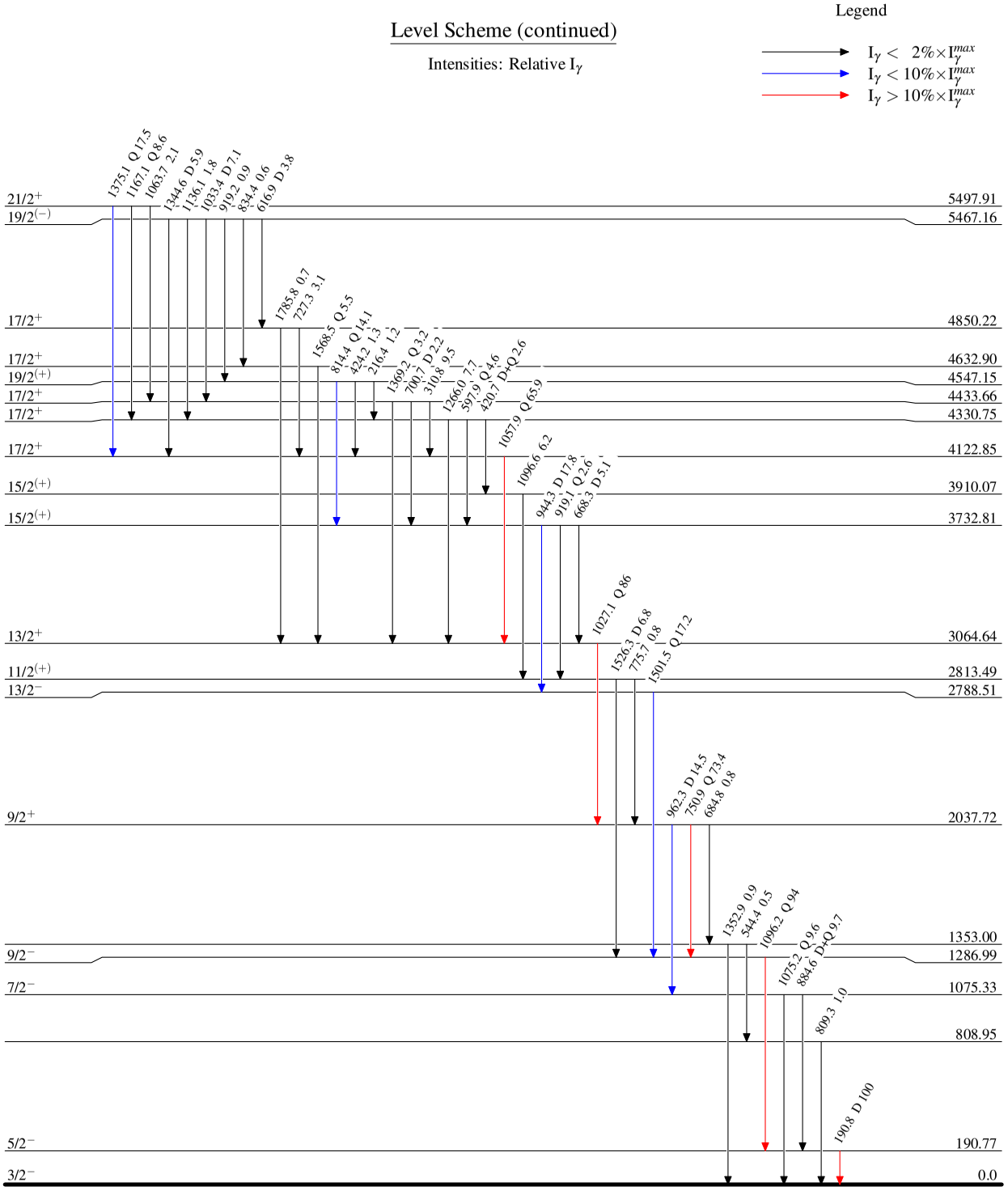


$^{65}_{31}Ga_{34}$

(HI,xnγ) 2001We11

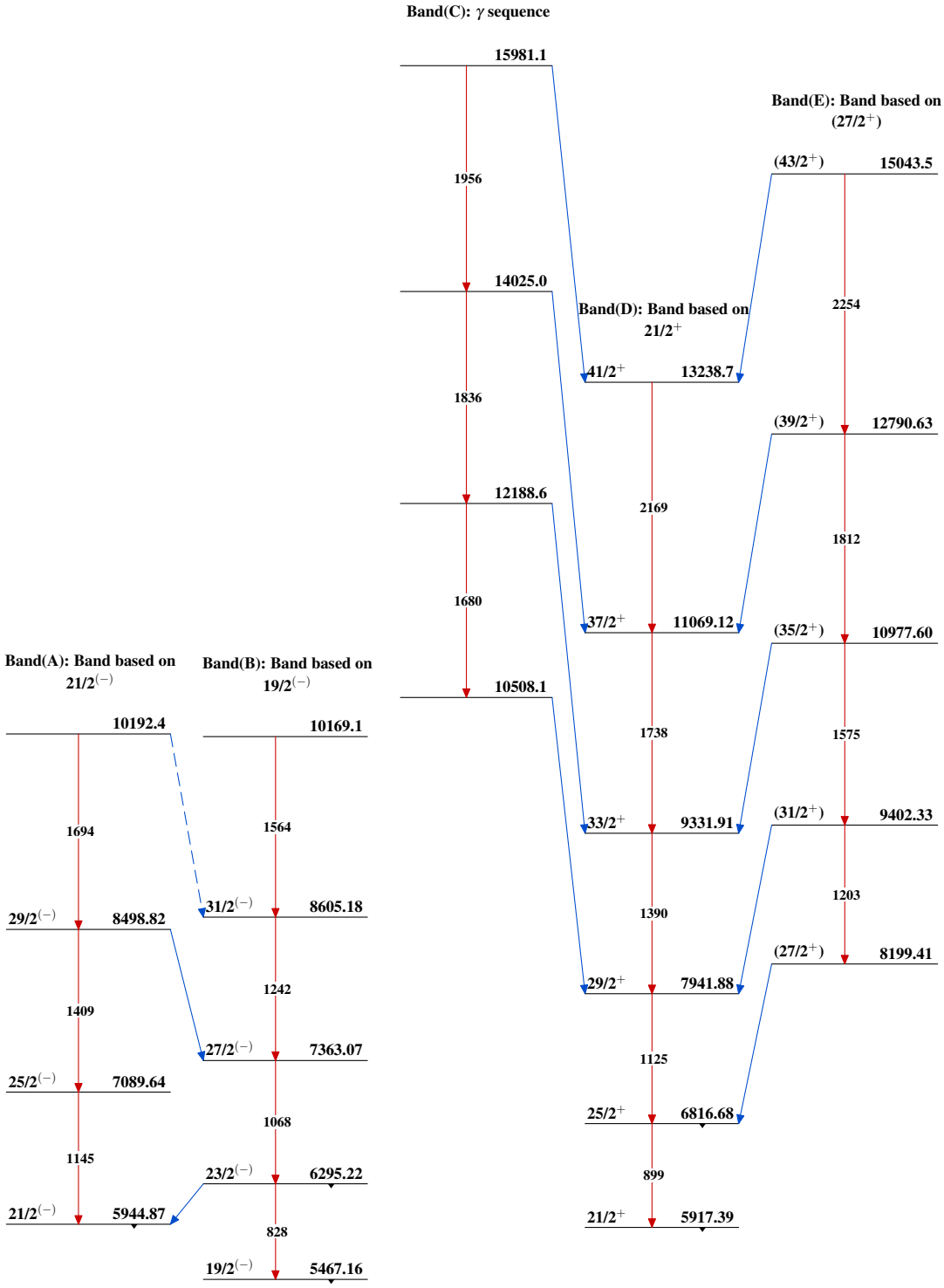
Level Scheme (continued)

Intensities: Relative I_γ



$^{65}_{31}Ga_{34}$

(HI,xnγ) 2001We11



$^{65}_{31}Ga_{34}$