^{152}Sm(^{17}O,4nγ) 1982Ro08

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 194,460 (2024)	31-Oct-2022

1982Ro08: ^{152}Sm(^{17}O,4nγ) E=80 MeV. Measured Eγ, Iγ, ce, γγ-coin, γ(θ) using a Ge(Li) detector and a Compton-suppressed Ge(Li) detector for γ rays, and a mini-orange spectrometer with Si(Li) detector for conversion electrons at the Niels Bohr Institute tandem accelerator.

^{165}Yb Levels

E(level)[†]	Jπ[#]	E(level)[†]	Jπ[#]	E(level)[†]	Jπ[#]	E(level)[†]	Jπ[#]
0.0[a]	5/2⁻	850.0[a] *3*	17/2⁻	2303.5[@] *5*	33/2⁺	3834.1[&] *8*	39/2⁺
87.48 *17*	7/2⁻	1174.4[@] *4*	25/2⁺	2389.9[&] *4*	31/2⁺	4155.3[b] *8*	43/2⁻
126.71 *24*	9/2⁺	1211.4[&] *4*	23/2⁺	2448.0[b] *6*	31/2⁻	4434.5[@] *9*	45/2⁺
197.42[a] *17*	9/2⁻	1280.6[a] *4*	21/2⁻	2726.1[a] *4*	33/2⁻	4472.6[a] *7*	45/2⁻
209.7[&] *3*	11/2⁺	1516.2?[‡] *11*		2954.0[b] *6*	35/2⁻	4861.3[b] *10*	47/2⁻
217.0[@] *3*	13/2⁺	1698.0[@] *5*	29/2⁺	2978.3[@] *5*	37/2⁺	5167.5[@] *14*	(49/2⁺)
419.1[&] *3*	15/2⁺	1758.3[a] *4*	25/2⁻	3085.0[&] *7*	35/2⁺	5188.4[a] *9*	49/2⁻
423.0[@] *4*	17/2⁺	1760.8[&] *4*	27/2⁺	3243.0[a] *5*	37/2⁻	5636.3[b] *14*	51/2⁻
484.39[a] *24*	13/2⁻	1915.4?[‡] *11*	27/2⁺	3519.9[b] *6*	39/2⁻	5968.4[a] *14*	53/2⁻
745.2[@] *4*	21/2⁺	1978.9[b] *6*	27/2⁻	3706.4[@] *7*	41/2⁺		
758.2[&] *3*	19/2⁺	2248.4[a] *4*	29/2⁻	3823.8[a] *5*	41/2⁻		

[†] From least-squares fit to Eγ data.
[‡] Reported by 1982Ro08 only. The evaluators consider this level as uncertain and is not listed in the Adopted Levels.
[#] As proposed by 1982Ro08 based on γ(θ) data and band assignments. These assignments are in agreement with those in the Adopted Levels, except that some are in parentheses there due to lack of strong supporting arguments.
[@] Band(A): ν5/2[642],α=+1/2.
[&] Band(a): ν5/2[642],α=−1/2.
[a] Band(B): ν5/2[523],α=+1/2.
[b] Band(C): Band based on 27/2⁻,α=−1/2.

γ(^{165}Yb)

Eγ[†]	Iγ[‡]	Ei(level)	J^π_i	E_f	J^π_f	Mult.[#]	Comments
39.2 *2*		126.71	9/2⁺	87.48	7/2⁻		
83.0 *2*		209.7	11/2⁺	126.71	9/2⁺		
87.5 *2*		87.48	7/2⁻	0.0	5/2⁻		
90.2 *2*		217.0	13/2⁺	126.71	9/2⁺		
110.0 *2*		197.42	9/2⁻	87.48	7/2⁻		
197.4 *2*	16.8 *17*	197.42	9/2⁻	0.0	5/2⁻	(Q)	A_2=+0.24 *3*; A_4=−0.03 *3*
202.1 *2*	14.7 *15*	419.1	15/2⁺	217.0	13/2⁺	D	A_2=−0.88 *3*; A_4=+0.14 *3*
206.0 *2*	108 *11*	423.0	17/2⁺	217.0	13/2⁺	Q	A_2=+0.27 *1*; A_4=−0.04 *1*
209.5 *2*	26.9 *27*	419.1	15/2⁺	209.7	11/2⁺	Q	A_2=+0.23 *4*; A_4=−0.08 *4*
274.6 *5*	1.4[@] *3*	484.39	13/2⁻	209.7	11/2⁺		
287.0 *2*	17.8 *18*	484.39	13/2⁻	197.42	9/2⁻	Q	A_2=+0.34 *5*; A_4=−0.18 *6*
322.2 *2*	100 *10*	745.2	21/2⁺	423.0	17/2⁺	Q	A_2=+0.33 *1*; A_4=−0.09 *1*
335.2 *5*	7.5 *15*	758.2	19/2⁺	423.0	17/2⁺	D+Q	A_2=−0.81 *6*; A_4=+0.23 *7*
336.1 *5*	[&]	2726.1	33/2⁻	2389.9	31/2⁺		
339.1 *2*	31 *3*	758.2	19/2⁺	419.1	15/2⁺	Q	A_2=+0.31 *2*; A_4=−0.07 *2*
365.6 *2*	17.7 *18*	850.0	17/2⁻	484.39	13/2⁻	Q	A_2=+0.35 *2*; A_4=−0.12 *3*

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$^{152}Sm(^{17}O,4n\gamma)$ 1982Ro08 (continued)

$\gamma(^{165}Yb)$ (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	Comments
429.1 2	85 9	1174.4	25/2+	745.2	21/2+	Q	A_2=+0.34 2; A_4=−0.08 2
430.6 2	19.0[@] 19	1280.6	21/2−	850.0	17/2−	Q	A_2=+0.33 3; A_4=−0.11 3
431 1	[&]	850.0	17/2−	419.1	15/2+		
453.2 2	34 3	1211.4	23/2+	758.2	19/2+	Q	A_2=+0.35 3; A_4=−0.11 3
466.1 5	8.0 8	1211.4	23/2+	745.2	21/2+	D	A_2=−0.38 10; A_4=+0.12 10
469.1 5	3.8 8	2448.0	31/2−	1978.9	27/2−	(Q)	A_2=+0.22 10; A_4=+0.13 10
477.7[a] 2	34[a] 3	1758.3	25/2−	1280.6	21/2−	(Q)	A_2=+0.33 7; A_4=−0.07 7
477.7[a] 2	34[a] 3	2726.1	33/2−	2248.4	29/2−		
488 1	8.5[@] 17	2248.4	29/2−	1760.8	27/2+		
490.1 2	11.0[@] 11	2248.4	29/2−	1758.3	25/2−	Q	A_2=+0.29 2; A_4=−0.08 2
506.0 2	12.1 12	2954.0	35/2−	2448.0	31/2−	Q	A_2=+0.24 6; A_4=−0.13 6
516.9 2	11.6 12	3243.0	37/2−	2726.1	33/2−	(Q)	A_2=+0.41 5; A_4=−0.05 5
522 1	3.0[@] 6	1280.6	21/2−	758.2	19/2+		
523.6 2	64 6	1698.0	29/2+	1174.4	25/2+	Q	A_2=+0.31 5; A_4=−0.06 5
541.5 5	1.9 4	3519.9	39/2−	2978.3	37/2+	D	A_2=−0.46 36; A_4=−0.13 40
546.8 5	4.2 8	1758.3	25/2−	1211.4	23/2+	D	A_2=−0.39 14; A_4=−0.10 14
549.4 2	21.9 22	1760.8	27/2+	1211.4	23/2+	Q	A_2=+0.32 5; A_4=−0.06 5
566.0 5	8.4 17	3519.9	39/2−	2954.0	35/2−	Q	A_2=+0.34 6; A_4=−0.12 6
580.8 2	10.6 11	3823.8	41/2−	3243.0	37/2−	(Q)	A_2=+0.32 4; A_4=+0.01 4
586.3 5	5.4 11	1760.8	27/2+	1174.4	25/2+	D	A_2=−0.12 12; A_4=0.00 13
605.5 2	40 4	2303.5	33/2+	1698.0	29/2+	Q	A_2=+0.28 3; A_4=−0.05 3
[x]627.6 5	7.4 15						A_2=+0.38 10; A_4=+0.10 12 This γ is not reported in any other in-beam γ-ray studies.
629.1 2	14.1 14	2389.9	31/2+	1760.8	27/2+	(Q)	A_2=+0.19 6; A_4=+0.02 6
635.4 5	3.9 8	4155.3	43/2−	3519.9	39/2−	(Q)	A_2=+0.21 10; A_4=0.00 10
648.8 5	4.8 10	4472.6	45/2−	3823.8	41/2−	(Q)	A_2=+0.40 14; A_4=0.00 14
650.4 5	7.5 15	2954.0	35/2−	2303.5	33/2+	D	A_2=−0.23 5; A_4=−0.05 6
674.8 2	19.9 19	2978.3	37/2+	2303.5	33/2+	Q	A_2=+0.25 4; A_4=−0.07 4
695.1 5	5.3 11	3085.0	35/2+	2389.9	31/2+	(Q)	A_2=+0.14 10; A_4=+0.07 10
704 1	2.6	1915.4?	27/2+	1211.4	23/2+		
706.0 5	3.6 7	4861.3	47/2−	4155.3	43/2−	(Q)	A_2=+0.24 10; A_4=−0.02 10
715.8 5	2.0 4	5188.4	49/2−	4472.6	45/2−	(Q)	A_2=+0.44 28; A_4=+0.01 28
728.1[a] 5	10.8[a] 11	3706.4	41/2+	2978.3	37/2+	(E2)	A_2=+0.15 6; A_4=−0.11 6; α(K)exp=0.007 2 γ(θ) and α(K) exp for doublet.
728.1[a] 5	10.8[a] 11	4434.5	45/2+	3706.4	41/2+	(E2)	
733 1	1.4[@] 3	5167.5	(49/2+)	4434.5	45/2+		
749.1 5	3.6 7	3834.1	39/2+	3085.0	35/2+	Q	A_2=+0.38 29; A_4=−0.51 29
750.1 5	6.3 13	2448.0	31/2−	1698.0	29/2+	D	A_2=−0.42 19; A_4=+0.43 22
771	[&]	1516.2?		745.2	21/2+		
775 1	[&]	5636.3	51/2−	4861.3	47/2−		
780 1	2.2 4	5968.4	53/2−	5188.4	49/2−	Q	A_2=+0.74 30; A_4=−0.34 20
804.6 5	5.1 10	1978.9	27/2−	1174.4	25/2+	E1	A_2=−0.47 13; A_4=+0.32 14; α(K)exp<0.004

[†] Uncertainties assigned from a general statement by 1982Ro08 that these range from 0.2 keV for strong lines (Iγ≥10) to 0.5 keV for weak lines. The evaluators have assigned 1 keV when Eγ is quoted to nearest keV.

[‡] Uncertainties assigned from a general statement by 1982Ro08 that these range from 10% for strong lines to 20% for weak lines.

[#] α(K)exp were normalized to α(K)(E2) for 605.5γ and 674.8γ. The values of α(K)exp are not given (1982Ro08) (with few exceptions). The mult=Q or D are assigned (by the evaluators) on the basis of γ(θ) data. Only for the 728γ doublet and 804.6γ, α(K)exp values were listed by 1982Ro08 which are the basis of E2 and E1 assignments, respectively.

[@] From γγ coin data, not corrected for γ(θ) effects.

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^{152}Sm(^{17}O,4nγ) 1982Ro08 (continued)

γ(^{165}Yb) (continued)

[&] Weak γ.
[a] Multiply placed with undivided intensity.
[x] γ ray not placed in level scheme.

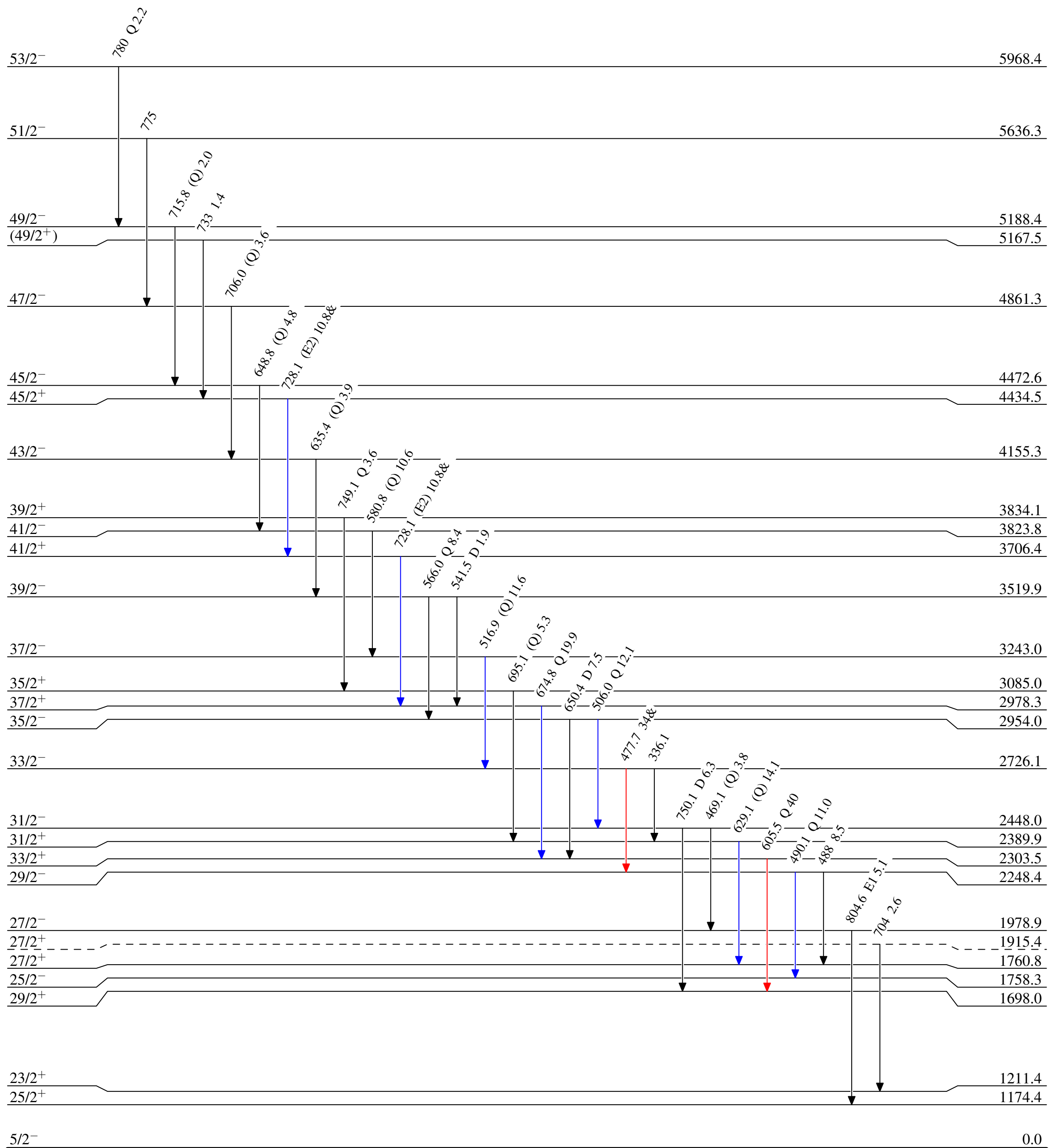
$^{152}Sm(^{17}O,4n\gamma)$ 1982Ro08

Level Scheme

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend

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

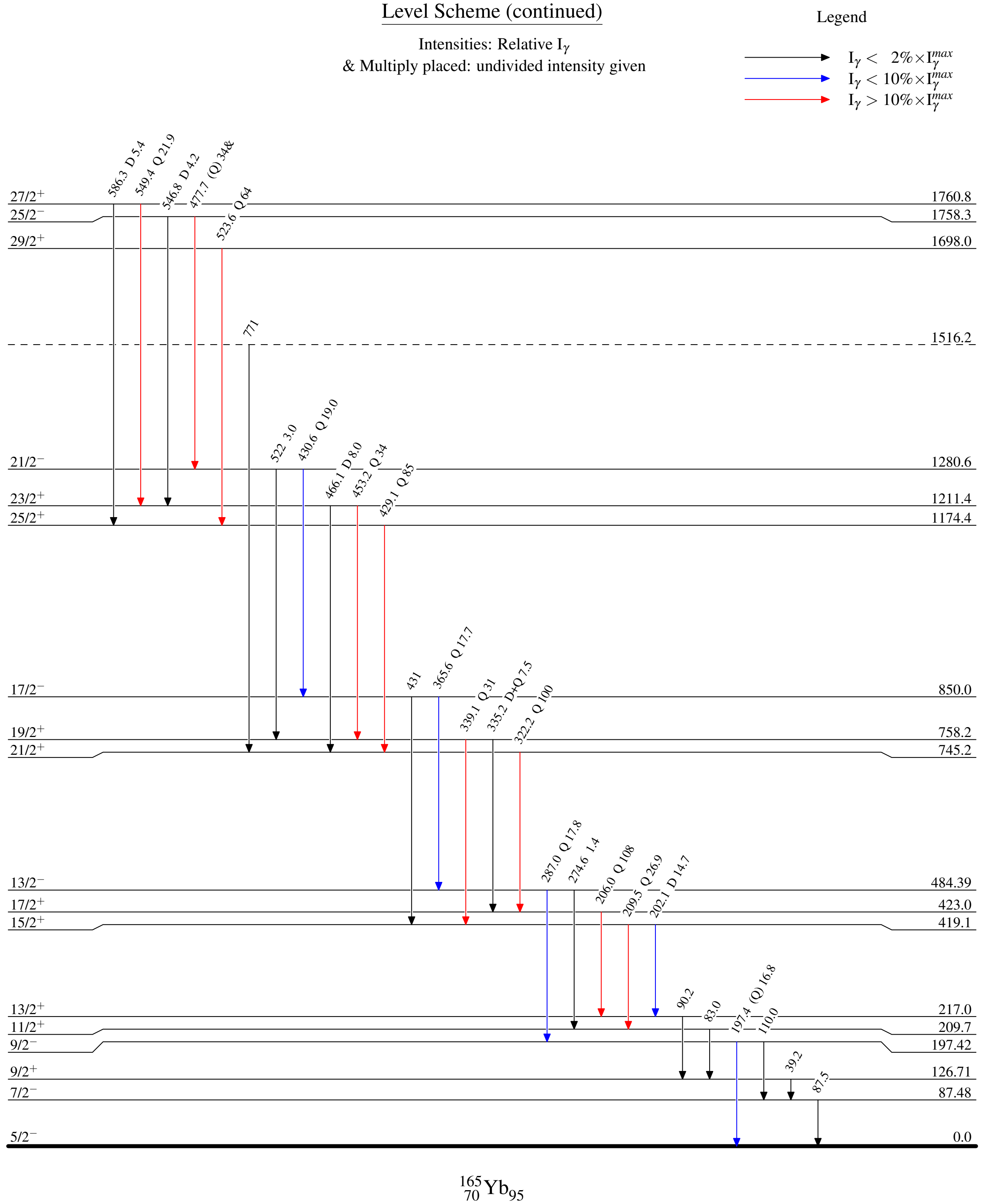


$^{165}_{70}Yb_{95}$

$^{152}Sm(^{17}O,4n\gamma)$ 1982Ro08

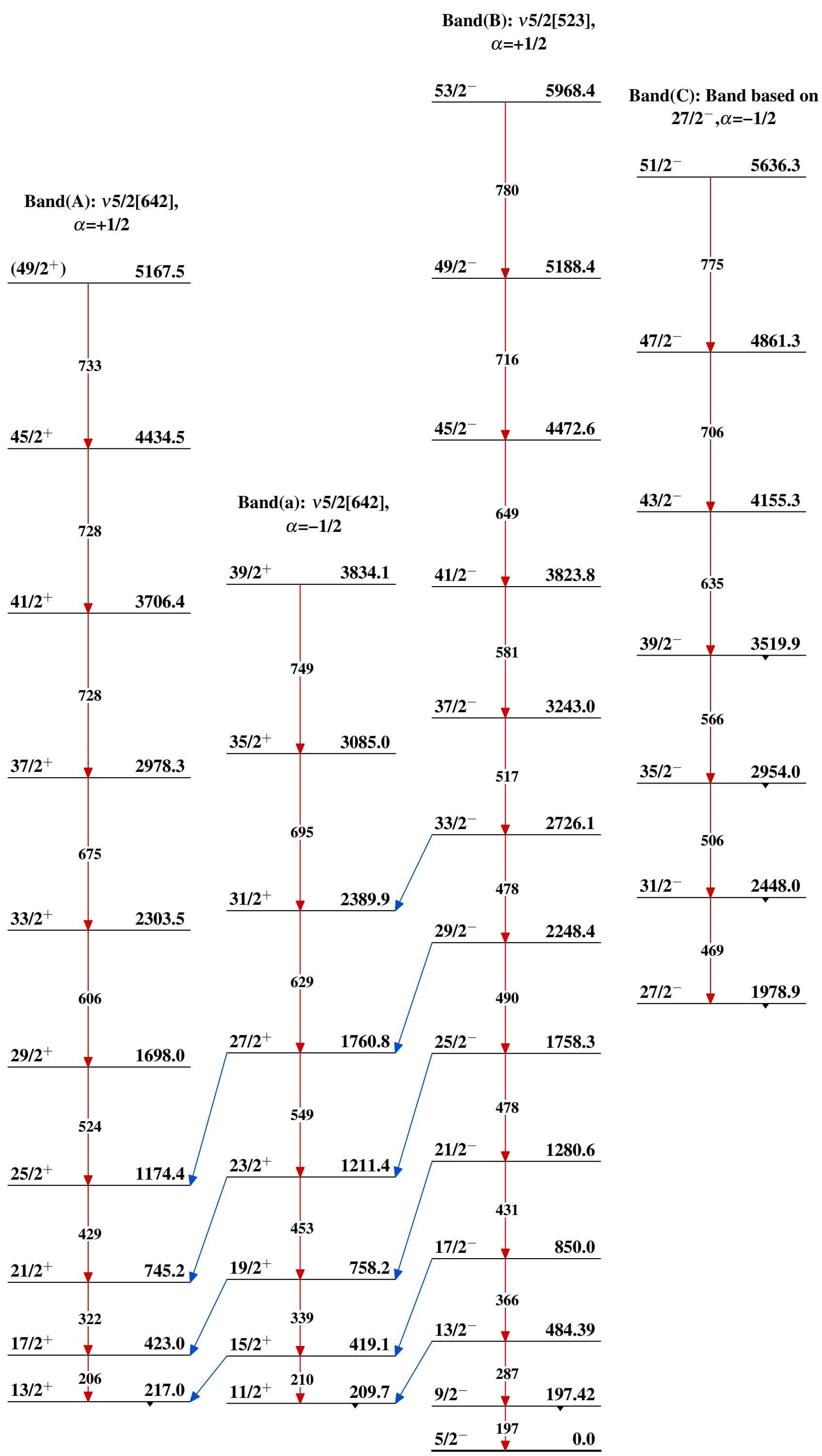
Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given



$^{165}_{70}Yb_{95}$

$^{152}Sm(^{17}O,4n\gamma)$ 1982Ro08



$^{165}_{70}Yb_{95}$