(HI,xnγ) 1999As05,2000Ha59,1979Re04

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 170, 1 (2020)	16-Aug-2020

1979Re04: ^{150}Nd(α,nγ) with E(α)=14-22 MeV; measured E_γ, I_γ, γγ coincidence; in addition to the placed γ's, 27 γ's are reported without an assignment to a particular nuclide.

1999As05: ^{154}Sm(^{176}Yb,xγ) with E(^{176}Yb) = 949 MeV and 1 GeV; measured E_γ and γγ coincidences in GAMMASPHERE array with 44 Compton-suppressed Ge detectors.

2000Ha59: ^{150}Nd(^{12}C,2αnγ) with E(^{12}C) = 65 keV; measured γ's in array of 11 Compton-suppressed Ge detector and 20 segment particle detector.

1996WaZQ: ^{238}U(^{209}Bi,^{209}Bi′), E ≈ 4-7 MeV/nucleon, measured γ's with 20 Compton suppressed Ge detectors along with 71 BGO detectors.

^{153}Sm Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0@	3/2+	411.9&	(15/2−)	1016.8&	(21/2−)	1761.7&	(27/2−)
53.5@	7/2+	417.3@	(17/2+)	1138.1@	(25/2+)	2036.7&	(29/2−)
65.5#@	9/2+	424.8@	(15/2+)	1199.4@	(23/2+)	2176.3@	(33/2+)
98.4#&	11/2−	596.6&	(17/2−)	1250.4&	(23/2−)	2324@	(31/2+)
188.9@	(11/2+)	733.4@	(21/2+)	1500.0&	(25/2−)	2325.7&	(31/2−)
195.8@	(13/2+)	764.0@	(19/2+)	1622.2@	(29/2+)	2793.3@	(37/2+)
245.4&	(13/2−)	798.5&	(19/2−)	1722@	(27/2+)	3467.0@	(41/2+)

† Calculated by evaluator from E_γ values.

‡ As given by the authors of all papers and in agreement with ^{153}Sm Adopted Levels.

No depopulating gamma-ray transitions were reported.

@ Band(A): $K^\pi=3/2^+$ band based on 3/2[651] mixed with 3/2[402].

& Band(B): 11/2[505] band.

γ(^{153}Sm)

Coincidence data are from 1979Re04.

E_γ†	I_γ‡	E_i(level)	J_i^π	E_f	J_f^π	E_γ†	I_γ‡	E_i(level)	J_i^π	E_f	J_f^π
53.5		53.5	7/2+	0.0	3/2+	313.4	11.8 *14*	411.9	(15/2−)	98.4	11/2−
123.3	43 *7*	188.9	(11/2+)	65.5	9/2+	316.0	54 *3*	733.4	(21/2+)	417.3	(17/2+)
130.4	69 *13*	195.8	(13/2+)	65.5	9/2+	339.0	43 *3*	764.0	(19/2+)	424.8	(15/2+)
135.3	31 *5*	188.9	(11/2+)	53.5	7/2+	347#		764.0	(19/2+)	417.3	(17/2+)
147.1	42 *7*	245.4	(13/2−)	98.4	11/2−	351.4	20.7 *16*	596.6	(17/2−)	245.4	(13/2−)
166.3	46 *7*	411.9	(15/2−)	245.4	(13/2−)	386.6	19.7 *15*	798.5	(19/2−)	411.9	(15/2−)
184.6	44 *7*	596.6	(17/2−)	411.9	(15/2−)	404.6	30.0 *21*	1138.1	(25/2+)	733.4	(21/2+)
201.8	30 *3*	798.5	(19/2−)	596.6	(17/2−)	420.3	16.2 *19*	1016.8	(21/2−)	596.6	(17/2−)
218.1	16.4 *19*	1016.8	(21/2−)	798.5	(19/2−)	435.5	12.5 *11*	1199.4	(23/2+)	764.0	(19/2+)
221.6	100	417.3	(17/2+)	195.8	(13/2+)	452.1	12.3 *11*	1250.4	(23/2−)	798.5	(19/2−)
228.9	16.4 *21*	424.8	(15/2+)	195.8	(13/2+)	466#		1199.4	(23/2+)	733.4	(21/2+)
233.6	8.9 *12*	1250.4	(23/2−)	1016.8	(21/2−)	482.0	10.5 *11*	1500.0	(25/2−)	1016.8	(21/2−)
235.9	51 *5*	424.8	(15/2+)	188.9	(11/2+)	484.1	24.7 *19*	1622.2	(29/2+)	1138.1	(25/2+)
248.7	4.0 *7*	1500.0	(25/2−)	1250.4	(23/2−)	511.3	9.4 *10*	1761.7	(27/2−)	1250.4	(23/2−)
263#b		1761.7	(27/2−)	1500.0	(25/2−)	524.0&		1722	(27/2+)	1199.4	(23/2+)

Continued on next page (footnotes at end of table)

(HI,xnγ) 1999As05,2000Ha59,1979Re04 (continued)

$\gamma(^{153}Sm)$ (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	E_γ [†]	E_i(level)	J_i^π	E_f	J_f^π
537.7	5.9 *8*	2036.7	$(29/2^-)$	1500.0	$(25/2^-)$	602[#]	2324	$(31/2^+)$	1722	$(27/2^+)$
554.1[&*a*]		2176.3	$(33/2^+)$	1622.2	$(29/2^+)$	617.0[&]	2793.3	$(37/2^+)$	2176.3	$(33/2^+)$
564.0	7.7 *9*	2325.7	$(31/2^-)$	1761.7	$(27/2^-)$	673.7[@]	3467.0	$(41/2^+)$	2793.3	$(37/2^+)$
584[#]		1722	$(27/2^+)$	1138.1	$(25/2^+)$					

[†] From 2000Ha59 unless otherwise noted. Uncertainties are only given in general statements as 0.2 to 0.8 keV (2002Ha59) and < 0.3 keV (1979Re04); specific values not given by evaluator.

[‡] From 2000Ha59; other: 1979Re04 where most of the values are for multiplets with a component from another nuclide.

[#] Energy and placement from 1996WaZQ.

[@] Energy and placement from 1999As05.

[&] Energy from 1999As05, placement from 1999As05 and 1996WaZQ.

[*a*] 2000Ha59 place a 563.0γ with Iγ=25.0 *20* above the $29/2^+$ member of the positive-parity band, but 1999As05 and 1996WaZQ place a 554γ above the $29/2^+$ level. Inspection of figure 1a of 2000Ha59 seems to give evidence for the presence of a 554γ in coin with 222γ+316γ gate. The results of 1999As05 and 1996WaZQ are adopted here since these two studies used much larger detector arrays as well as they extended the band beyond $33/2^+$ by two transitions.

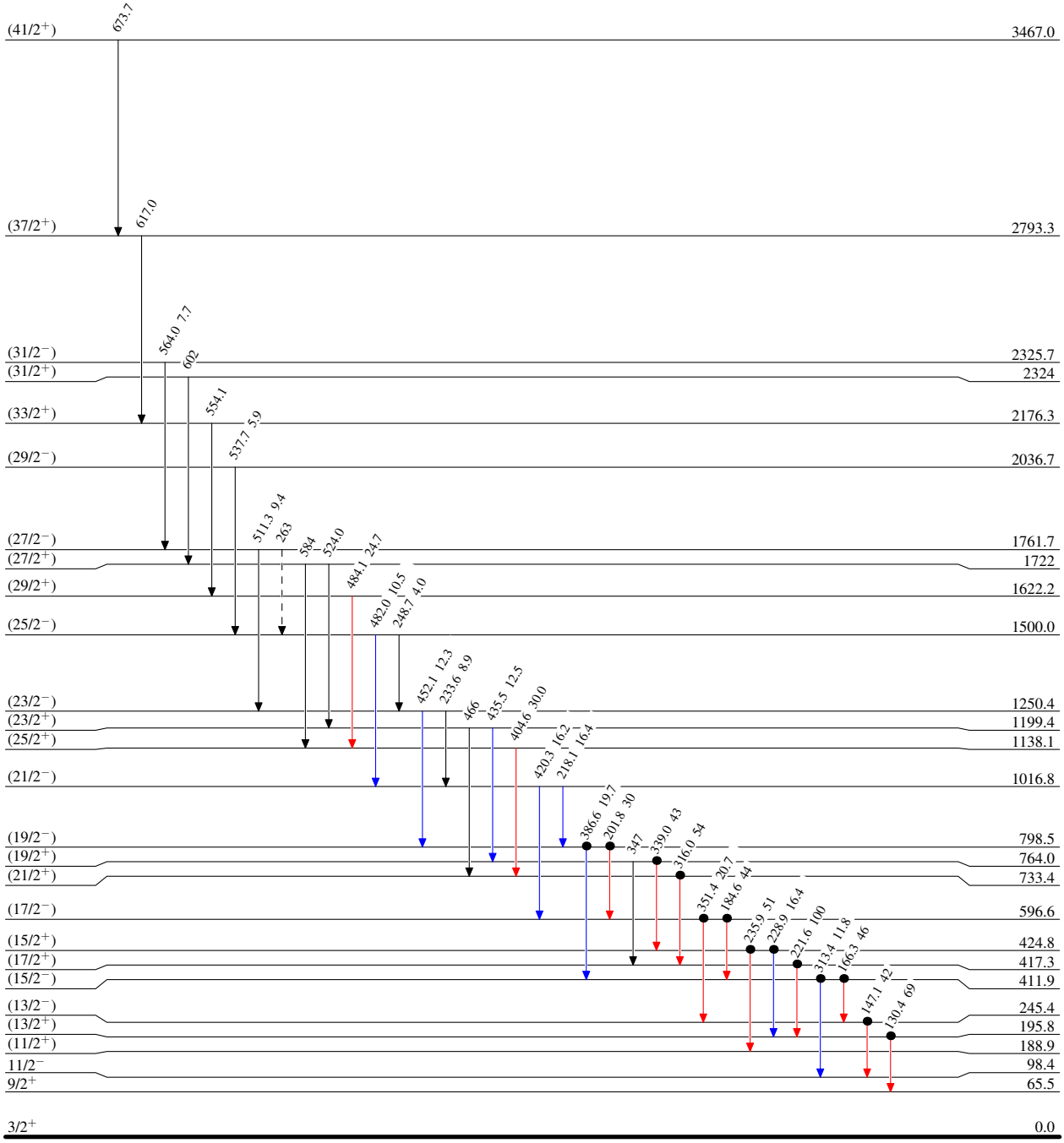
[*b*] Placement of transition in the level scheme is uncertain.

(HI,xnγ) 1999As05,2000Ha59,1979Re04

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)
- Coincidence

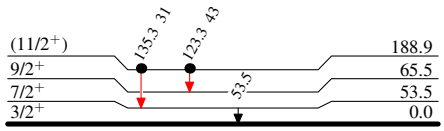


$^{153}_{62}Sm_{91}$

(HI,xnγ) 1999As05,2000Ha59,1979Re04

Level Scheme (continued)

Intensities: Relative I_γ

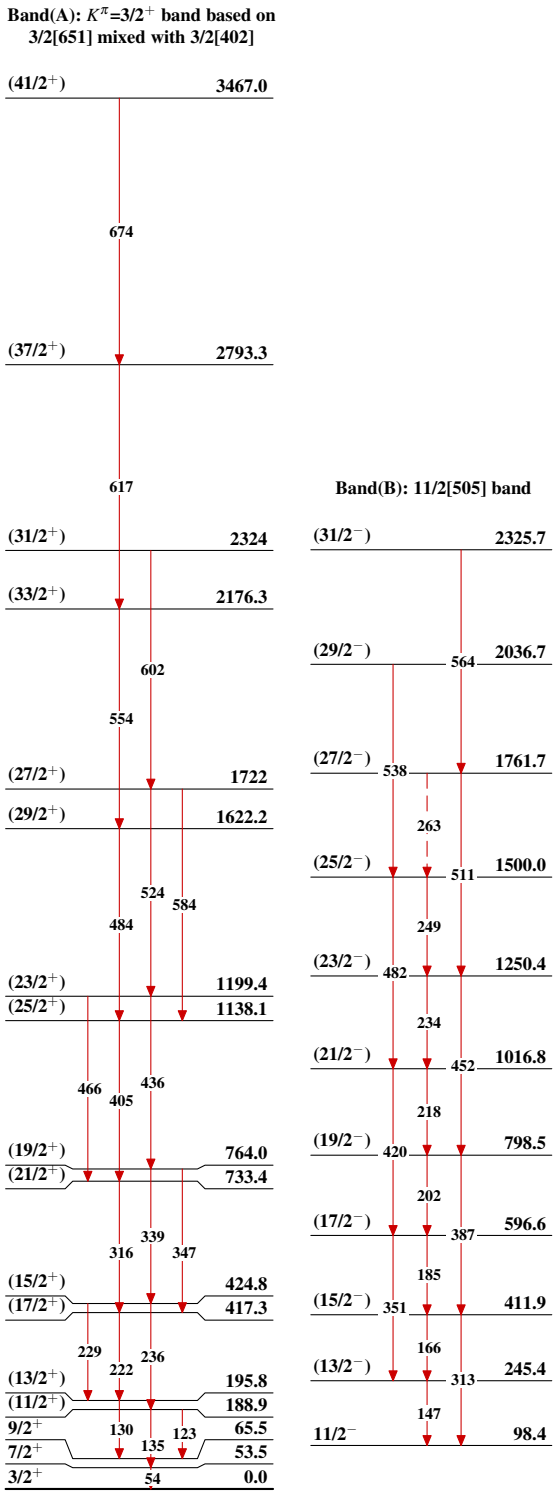


$^{153}_{62}Sm_{91}$

Legend

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

(HI,xnγ) 1999As05,2000Ha59,1979Re04



$^{153}_{62}Sm_{91}$