^{142}Nd(^{32}S,p3nγ) 2004Wa35

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. M. Baglin[1], E. A. Mccutchan[2], S. Basunia[1]	NDS 153, 1 (2018)	1-Oct-2018

E=155, 166 MeV. Measured Eγ, Iγ, $\gamma\gamma$ coin, γ-K x ray coin using 12 HPGe detectors with BGO anti-Compton suppressors. In order to identify the in-beam γ-rays belonging to ^{170}Re, the experiment was performed at both of the above mentioned beam energies. The $\gamma\gamma$ coincidence measurements were performed at 166 MeV.

^{170}Re Levels

E(level)†	J$^\pi$‡	Comments
0.0	(5$^+$)	
210.5 *3*	(7$^+$)	
0.0+x@	(9$^-$)	E(level): connection with known 210.5 level could not be established, but coincidences between transitions In band based on this level and the 210.5γ from the known 210.5 level imply x>210.5. Additional information 1.
82.5+x# *5*	(10$^-$)	
214.5+x@ *6*	(11$^-$)	
403.4+x# *7*	(12$^-$)	
621.9+x@ *7*	(13$^-$)	
889.5+x# *7*	(14$^-$)	
1169.2+x@ *8*	(15$^-$)	
1487.5+x# *8*	(16$^-$)	
1806.3+x@ *9*	(17$^-$)	
2146.3+x# *9*	(18$^-$)	
2473.1+x@ *10*	(19$^-$)	
2778.5+x# *10*	(20$^-$)	
3058.5+x@ *11*	(21$^-$)	
3415.5+x?# *12*	(22$^-$)	E(level): level not adopted; more extensive data from a subsequent (^{55}Mn,3nγ) study fail to confirm its existence.

† From least-squares fit to Eγ.
‡ Tentative values based on comparison with $\pi h_{11/2}\otimes\nu i_{13/2}$ band in ^{172}Re.
# Band(A): $\pi h_{11/2}\otimes\nu i_{13/2}$, α=0.
@ Band(a): $\pi h_{11/2}\otimes\nu i_{13/2}$, α=1.

$\gamma(^{170}$Re)

E$_\gamma$†	I$_\gamma$‡	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
x		0.0+x	(9$^-$)	0.0	(5$^+$)	
82.5 *5*	22 *10*	82.5+x	(10$^-$)	0.0+x	(9$^-$)	E$_\gamma$: assigned in 2004Wa35. Measured in coin and identified with the corresponding (10$^-$) to (9$^-$), 95.6 transition in ^{172}Re.
131.9 *3*	56 *6*	214.5+x	(11$^-$)	82.5+x	(10$^-$)	
188.9 *3*	100 *8*	403.4+x	(12$^-$)	214.5+x	(11$^-$)	
210.5 *3*	≥100	210.5	(7$^+$)	0.0	(5$^+$)	
218.6 *3*	85 *12*	621.9+x	(13$^-$)	403.4+x	(12$^-$)	
267.5 *3*	57 *6*	889.5+x	(14$^-$)	621.9+x	(13$^-$)	
279.7# *10*	61# *10*	1169.2+x	(15$^-$)	889.5+x	(14$^-$)	
279.7# *10*	61# *10*	3058.5+x	(21$^-$)	2778.5+x	(20$^-$)	
304.9 *5*	33 *4*	2778.5+x	(20$^-$)	2473.1+x	(19$^-$)	E$_\gamma$: from figures 2 and 3 of 2004Wa35; 304.1 listed in authors' table I.

Continued on next page (footnotes at end of table)

^{142}Nd(^{32}S,p3nγ) 2004Wa35 (continued)

$\gamma(^{170}Re)$ (continued)

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
318.4[#] *10*	58[#] *12*	1487.5+x	(16^-)	1169.2+x	(15^-)	547.2 *5*	37 *15*	1169.2+x	(15^-)	621.9+x	(13^-)
318.4[#] *10*	58[#] *12*	1806.3+x	(17^-)	1487.5+x	(16^-)	585.5 *5*	22 *9*	3058.5+x	(21^-)	2473.1+x	(19^-)
321.5 *10*	6 *3*	403.4+x	(12^-)	82.5+x	(10^-)	598.0 *5*	30 *11*	1487.5+x	(16^-)	889.5+x	(14^-)
326.5 *10*	17 *7*	2473.1+x	(19^-)	2146.3+x	(18^-)	632.5 *5*	22 *8*	2778.5+x	(20^-)	2146.3+x	(18^-)
340.1 *5*	25 *8*	2146.3+x	(18^-)	1806.3+x	(17^-)	637.0[#] *10*	39[#] *13*	1806.3+x	(17^-)	1169.2+x	(15^-)
357.0[@] *10*		3415.5+x?	(22^-)	3058.5+x	(21^-)	637.0 *10*	39 *13*	3415.5+x?	(22^-)	2778.5+x	(20^-)
407.3 *5*	22 *11*	621.9+x	(13^-)	214.5+x	(11^-)	659.0 *5*	23 *7*	2146.3+x	(18^-)	1487.5+x	(16^-)
486.3 *5*	21 *8*	889.5+x	(14^-)	403.4+x	(12^-)	666.5 *5*	22 *7*	2473.1+x	(19^-)	1806.3+x	(17^-)

[†] 2004Wa35 quote uncertainty as 0.3 to 1.0 keV. The evaluator assigns 0.3 keV for Iγ>50, 0.5 for Iγ=20-50, 1 keV for Iγ<20 and for doublets.

[‡] Extracted from the $\gamma\gamma$ coin spectra at E=166 MeV by setting gates on the low-lying transitions.

[#] Multiply placed with undivided intensity.

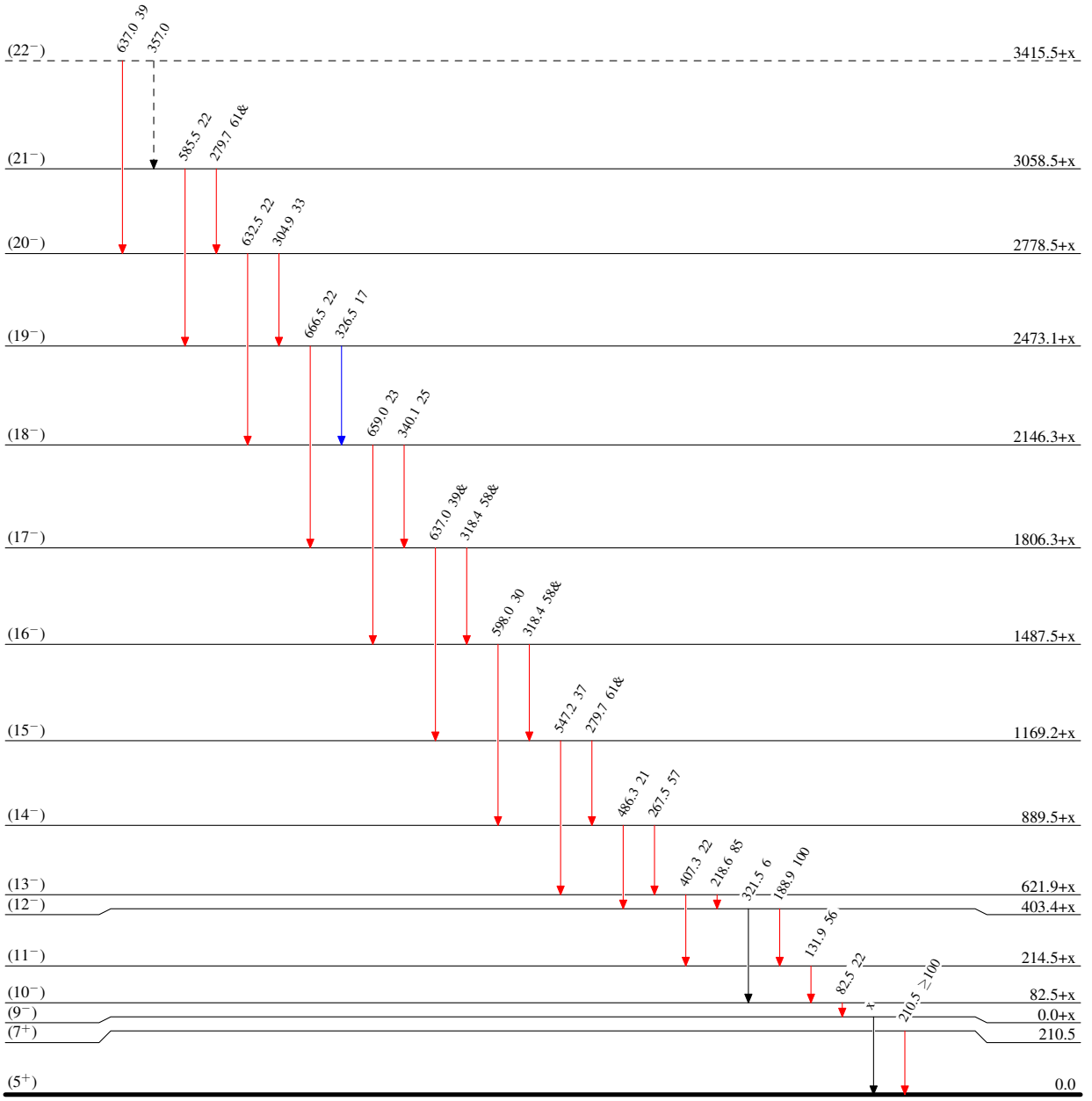
[@] Placement of transition in the level scheme is uncertain.

^{142}Nd(^{32}S,p3nγ) 2004Wa35

Level Scheme

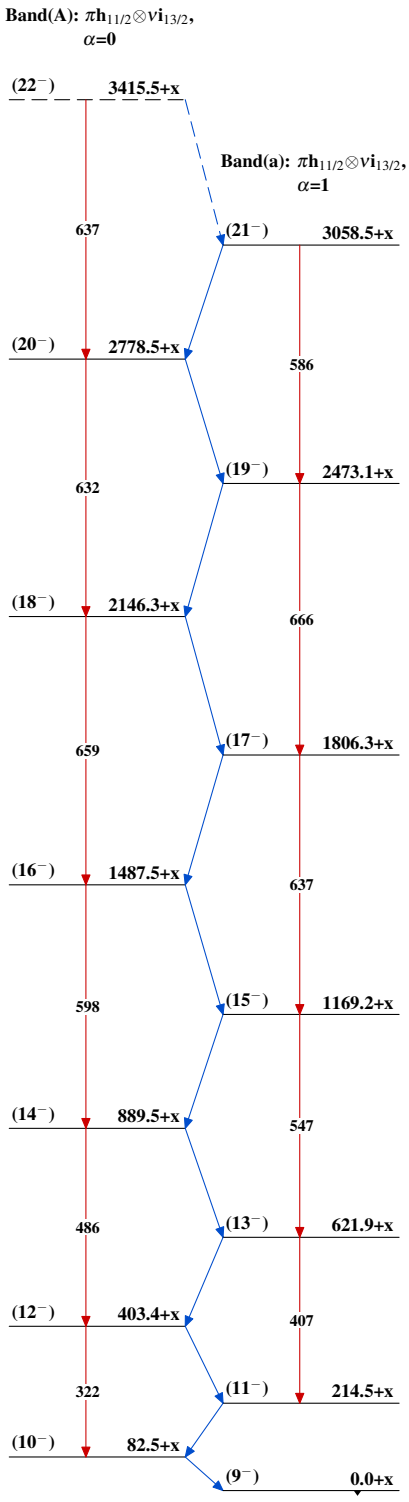
Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



$^{170}_{75}Re_{95}$

^{142}Nd(^{32}S,p3nγ) 2004Wa35



$^{170}_{75}Re_{95}$