

<sup>142</sup>Nd(<sup>30</sup>Si,p3nγ) 1992Th02

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 111, 1807 (2010)	15-Jun-2010

The level scheme and all data are from 1992Th02. E(<sup>30</sup>Si)=165 MeV, evaporation-residue separation; 98% target enrichment; measured E<sub>γ</sub>, I<sub>γ</sub>, γγ coin (detector array with 29 Compton-suppressed germanium detectors; θ=37°, 63°, 79°, 101°, 117°, 143°).

<sup>168</sup>Ta Levels

E(level) <sup>†</sup>	E(level) <sup>†</sup>	E(level) <sup>†</sup>	E(level) <sup>†</sup>
0.0+x <sup>‡</sup>	1326.1+x <sup>‡</sup> 13	3575.8+x? <sup>‡</sup> 16	1012.3+y <sup>#</sup> 11
103.5+x <sup>‡</sup> @ 10	1612.3+x <sup>‡</sup> 14	3882.0+x? <sup>‡</sup> 17	1260.5+y <sup>#</sup> 12
224.7+x <sup>‡</sup> @ 12	1932.1+x <sup>‡</sup> 14	0.0+y <sup>#</sup>	1567.4+y <sup>#</sup> 13
388.3+x <sup>‡</sup> 12	2256.7+x <sup>‡</sup> 14	151.2+y <sup>#</sup> 8	1843.0+y <sup>#</sup> 14
565.8+x <sup>‡</sup> 13	2588.1+x <sup>‡</sup> 14	317.4+y <sup>#</sup> 8	2171.0+y? <sup>#</sup> 14
802.2+x <sup>‡</sup> 13	2929.5+x <sup>‡</sup> 15	532.7+y <sup>#</sup> 9	2460.3+y? <sup>#</sup> 15
1038.9+x <sup>‡</sup> 13	3240.4+x? <sup>‡</sup> 16	744.0+y <sup>#</sup> 10	

<sup>†</sup> From least-squares fit to E<sub>γ</sub>.

<sup>‡</sup> Band(A): π=(-) band. Strongly coupled band; probable configuration: (π 1h<sub>11/2</sub>)⊗(ν 1i<sub>13/2</sub>) based on low-lying quasiproton and quasineutron states in neighboring odd-A nuclides.

<sup>#</sup> Band(B): π=(+) band. Strongly coupled band; probable configuration: (π 2d<sub>5/2</sub>)⊗(ν 1i<sub>13/2</sub>).

@ ADOPTED energy differs because adopted order of 104γ and 121γ is the reverse of that from 1992Th02; also, 225γ placement is not ADOPTED.

γ(<sup>168</sup>Ta)

E <sub>γ</sub> <sup>†</sup>	I <sub>γ</sub> <sup>‡</sup>	E <sub>i</sub> (level)	E <sub>f</sub>	Comments
103.5 10		103.5+x	0.0+x	
<sup>x</sup> 108.0 10				
121.2 10	26	224.7+x	103.5+x	I <sub>γ</sub> : unreliable because of low detector efficiency.
151.2 10		151.2+y	0.0+y	
163.6 5	100	388.3+x	224.7+x	
166.2 10		317.4+y	151.2+y	
177.5 5	109	565.8+x	388.3+x	
<sup>x</sup> 198.6 10	≈27			
211.3 10		744.0+y	532.7+y	
215.4 10		532.7+y	317.4+y	
225		224.7+x	0.0+x	E <sub>γ</sub> : from figs. 6 and 7 of 1992Th02, but not listed in table 2. Existence unconfirmed in a later <sup>145</sup> Nd( <sup>27</sup> Al,4nγ) study; γ not ADOPTED.
236.4 10	136	802.2+x	565.8+x	I <sub>γ</sub> : I(225γ)/I(121γ)=0.30 15 (1992Th02).
236.6 10	136	1038.9+x	802.2+x	I <sub>γ</sub> : for 236.4γ+236.6γ doublet.
248.1 10		1260.5+y	1012.3+y	I <sub>γ</sub> : for 236.4γ+236.6γ doublet.
268.3 10		1012.3+y	744.0+y	
275.3 10		1843.0+y	1567.4+y	
<sup>x</sup> 283.6 10				
284.8 10	102	388.3+x	103.5+x	I <sub>γ</sub> : for 284.8γ+286.4γ+287.2γ multiplet; placement not ADOPTED.
286.4 10	102	1612.3+x	1326.1+x	I <sub>γ</sub> : for 284.8γ+286.4γ+287.2γ multiplet.
287.2 10	102	1326.1+x	1038.9+x	I <sub>γ</sub> : for 284.8γ+286.4γ+287.2γ multiplet.
289.4 <sup>#</sup> 10		2460.3+y?	2171.0+y?	
306.2 <sup>#</sup> 10	18	3882.0+x?	3575.8+x?	

Continued on next page (footnotes at end of table)

$^{142}\text{Nd}(^{30}\text{Si,p3n}\gamma)$  **1992Th02 (continued)** $\gamma(^{168}\text{Ta})$  (continued)

$E_\gamma$ †	$I_\gamma$ ‡	$E_i(\text{level})$	$E_f$	Comments
307.0 <i>10</i>		1567.4+y	1260.5+y	
310.9# <i>10</i>	24	3240.4+x?	2929.5+x	
317.4 <i>10</i>		317.4+y	0.0+y	
<sup>x</sup> 319.4 <i>10</i>				
319.7 <i>5</i>	36	1932.1+x	1612.3+x	
324.6 <i>5</i>	32	2256.7+x	1932.1+x	
327.7# <i>10</i>		2171.0+y?	1843.0+y	
331.5 <i>10</i>	26	2588.1+x	2256.7+x	
335.5# <i>10</i>	29	3575.8+x?	3240.4+x?	
341.1 <i>5</i>	54	565.8+x	224.7+x	$I_\gamma: I(341\gamma)/I(178\gamma)=0.41$ 9 (1992Th02).
341.4 <i>10</i>	24	2929.5+x	2588.1+x	
<sup>x</sup> 366.3 <i>10</i>	≈17			
381.5 <i>10</i>		532.7+y	151.2+y	
414.0 <i>5</i>	56	802.2+x	388.3+x	
426.6 <i>10</i>		744.0+y	317.4+y	
473.0 <i>5</i>	57	1038.9+x	565.8+x	
479.6 <i>10</i>		1012.3+y	532.7+y	
516.4 <i>10</i>		1260.5+y	744.0+y	
523.9 <i>5</i>	56	1326.1+x	802.2+x	
555.2 <i>10</i>		1567.4+y	1012.3+y	
573.4 <i>5</i>	59	1612.3+x	1038.9+x	
582.3 <i>10</i>		1843.0+y	1260.5+y	$I_\gamma$ : includes possible contaminant.
604.0# <i>10</i>		2171.0+y?	1567.4+y	
606.0 <i>5</i>	57	1932.1+x	1326.1+x	$I_\gamma: I(606\gamma)/I(320\gamma)=1.43$ 23 (1992Th02).
617.2# <i>10</i>		2460.3+y?	1843.0+y	
641.6# <i>10</i>	51	3882.0+x?	3240.4+x?	$I_\gamma$ : for 641.6γ+644.3γ doublet.
644.3 <i>10</i>	51	2256.7+x	1612.3+x	$I_\gamma$ : for 641.6γ+644.3γ doublet. $I(644\gamma)/I(325\gamma)=2.0$ 12 (1992Th02).
646.2# <i>10</i>	≈30	3575.8+x?	2929.5+x	
<sup>x</sup> 652 <i>1</i>				
652.4# <i>10</i>	23	3240.4+x?	2588.1+x	
656.0 <i>5</i>	37	2588.1+x	1932.1+x	$I_\gamma: I(656\gamma)/I(332\gamma)=1.40$ 22 (1992Th02).
672.8 <i>5</i>	47	2929.5+x	2256.7+x	$I_\gamma$ : includes possible contaminant.
<sup>x</sup> 706.1 <i>10</i>	24			

†  $\Delta E=0.5$  keV, except for multiplets ( $\Delta E=1$  keV) and weak peaks ( $\Delta E=1$  keV). Evaluator assumed weak peaks to be those with  $I_\gamma \leq 30$ .

‡ Arbitrary units relative to  $I_\gamma(163.6\gamma)=100$ ;  $\Delta I_\gamma$  ranges from 10% to 40%. Branching ratios for several levels are given in comments.

# Placement of transition in the level scheme is uncertain.

<sup>x</sup>  $\gamma$  ray not placed in level scheme.

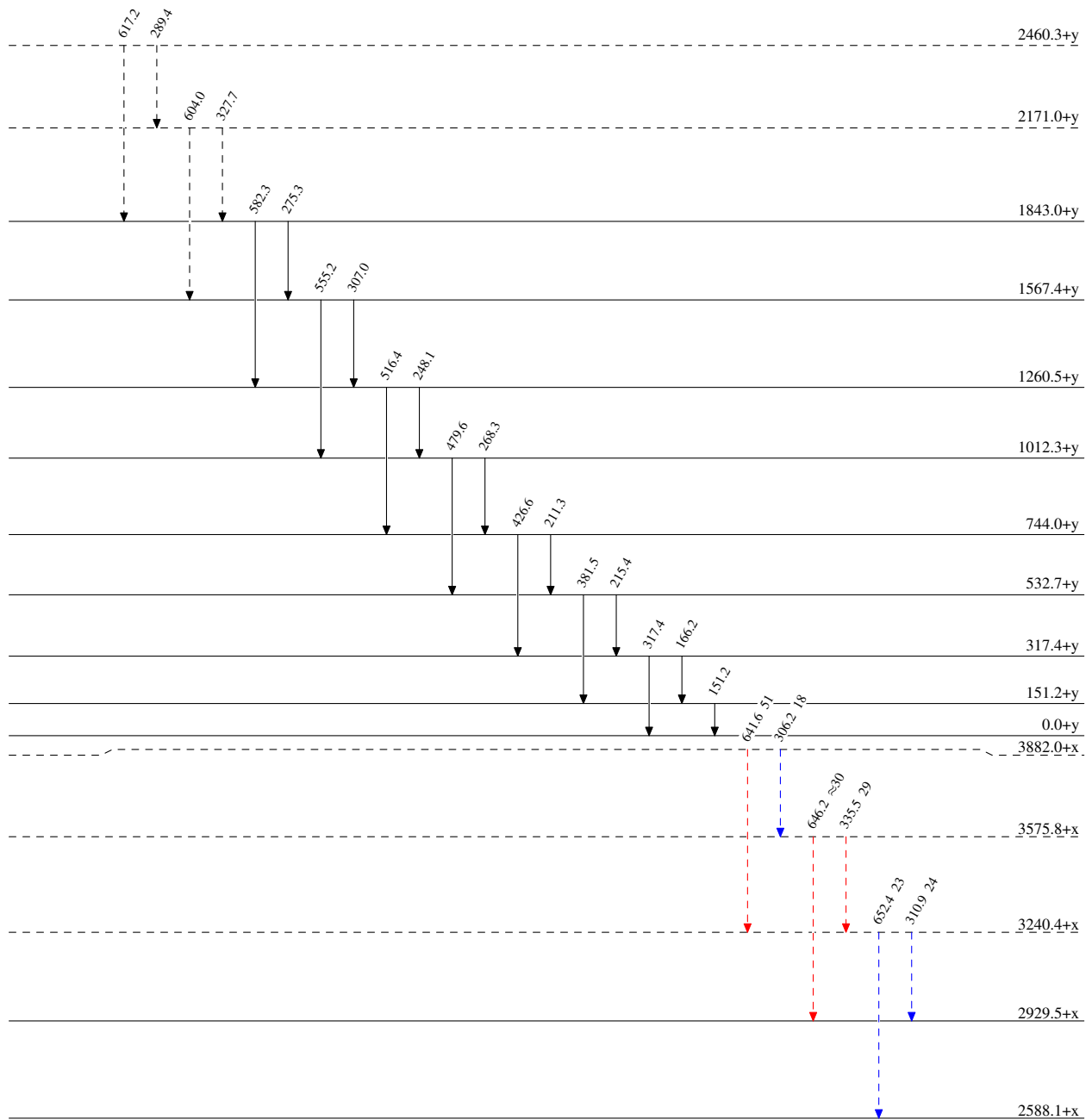
$^{142}\text{Nd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$  1992Th02

Legend

## Level Scheme

Intensities: Relative  $I_\gamma$ 

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

 $^{168}_{73}\text{Ta}_{95}$

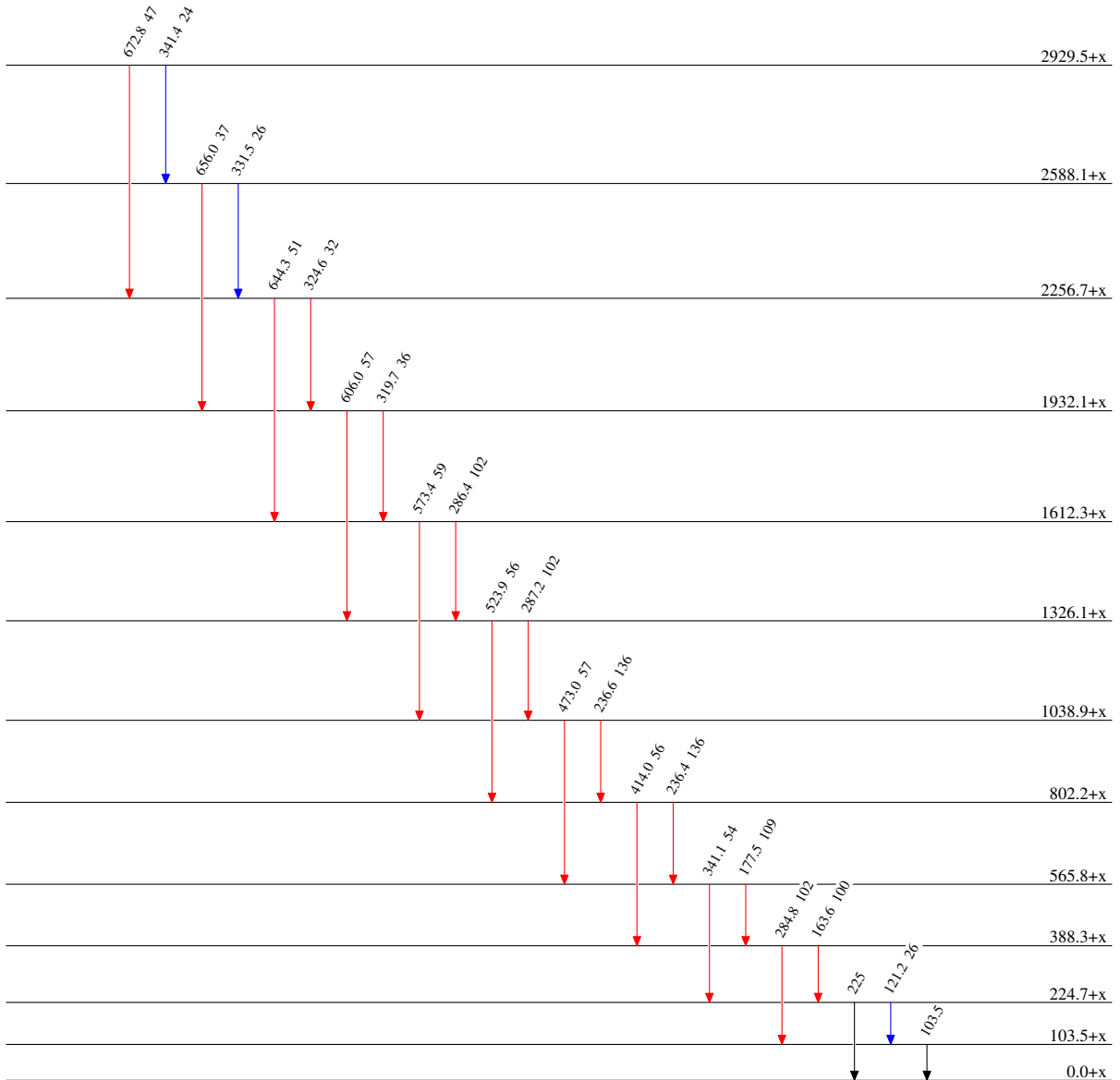
$^{142}\text{Nd}(^{30}\text{Si,p3n}\gamma)$  1992Th02

Level Scheme (continued)

Intensities: Relative  $I_\gamma$

Legend

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



$^{168}_{73}\text{Ta}_{95}$

$^{142}\text{Nd}(^{30}\text{Si,p3n}\gamma)$  1992Th02