

Coulomb excitation 1983Ku05,1980Si16,1958Ne03

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 107, 2323 (2006)	15-Mar-2006

1983Ku05: Target: ^{237}Np ; Projectile: ^{208}Pb , $E=5.3$ MeV/u; Detector: Three Ge(Li) detectors at $\theta=30^\circ \phi=0^\circ$, $\theta=150^\circ \phi=0^\circ$, and $\theta=150^\circ \phi=180^\circ$, respectively, with respect to the beam direction; Measured: $E\gamma$.

1980Si16: Target: ^{237}Np oxide; Projectile: ^{84}Kr , $E=5.36$ MeV/nucleon; Detector: Two Ge(Li) detectors at $\pm 90^\circ$ to the beam axis; Measured: $E\gamma$.

1958Ne03: Target: ^{237}Np ; Projectile: α , $E=2.85$ MeV; Detector: a xenon filled proportional counter.

 ^{237}Np Levels

E(level) [†]	$J\pi^{\ddagger}$	$T_{1/2}$	Comments
0.0 [#]	5/2 ⁺		
33.25 [@] 20	7/2 ⁺	54 ps 24	B(E2) $\uparrow=3.1$ 8 B(E2)=4.5 +0.6-0.9 was deduced using $\alpha(33.2\gamma)=273$ in 1958Ne03 . B(E2)=3.1 8 when it is corrected for the adopted value of $\alpha=185$ 23. $T_{1/2}$: calculated by the evaluator from B(E2)=3.1 8, $\delta(33\gamma)=0.13$ 3, and $\alpha=185$ 23.
75.8 [#] 4	9/2 ⁺	≈ 28 ps	B(E2) $\uparrow\approx 1.7$ B(E2)=2.4 5 was deduced using $\alpha(42.57\gamma)=119$ +5-11 and $\alpha(76\gamma)=57$ (1958Ne03). The values of $\alpha(42\gamma)\approx 80$, $\alpha(76\gamma)=53.4$ have been used by the evaluator to recalculate B(E2) ≈ 1.7 . $T_{1/2}$: calculated by the evaluator from B(E2) ≈ 1.7 , $\alpha(75.8\gamma,[E2])=53.4$ and $\alpha(42.73\gamma,[M1+E2])=80$, and 75.8 γ adopted properties.
129.9 [@] 10	11/2 ⁺		
191.2 [#] 10	13/2 ⁺		
269.8 [@] 13	15/2 ⁺		
348.2 [#] 13	17/2 ⁺		
454.3 [@] 15	19/2 ⁺		
546.7 [#] 15	21/2 ⁺		
684.3 [@] 16	23/2 ⁺		
786.8 [#] 16	25/2 ⁺		
959.4 [@] 16	27/2 ⁺		
1068.1 [#] 17	29/2 ⁺		
1278.4 [@] 18	31/2 ⁺		
1389.2 [#] 19	33/2 ⁺		
1639.3 [@] 19	35/2 ⁺		
1748.6 [#] 20	37/2 ⁺		
2040.9 [@] 20	39/2 ⁺		
2145.4 [#] 21	41/2 ⁺		
2480.1 [@] 21	43/2 ⁺		
2577.3 [#] 23	45/2 ⁺		
2955.4 [@] 23	47/2 ⁺		
3042.8 [#] 25	49/2 ⁺		
3464.0 [@] 25	51/2 ⁺		
3540 [#] 3	53/2 ⁺		
4004 [@] 3	55/2 ⁺		
4068 [#] 3	57/2 ⁺		

Continued on next page (footnotes at end of table)

Coulomb excitation 1983Ku05,1980Si16,1958Ne03 (continued)

²³⁷Np Levels (continued)

† From a least square fit to γ -ray energies, assuming $\Delta E=1$ keV for all γ -ray energies.

‡ From Adopted Levels.

Signature $\alpha=+1/2$ states.

@ Signature $\alpha=-1/2$ states.

$\gamma(^{237}\text{Np})$

E_γ †	I_γ ‡	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	δ	α @	Comments
33.24# 20	100	33.25	7/2 ⁺	0.0	5/2 ⁺	M1+E2	0.13 3	185 23	B(M1)(W.u.)=0.06 3; B(E2)(W.u.)=2.6×10 ² 18 Mult., δ : From Adopted Levels.
42.57# 30	28 4	75.8	9/2 ⁺	33.25	7/2 ⁺			≈80	
76#	3 2	75.8	9/2 ⁺	0.0	5/2 ⁺			54.6	
96.7		129.9	11/2 ⁺	33.25	7/2 ⁺				
115.4		191.2	13/2 ⁺	75.8	9/2 ⁺				
137.6&		684.3	23/2 ⁺	546.7	21/2 ⁺				
139.9		269.8	15/2 ⁺	129.9	11/2 ⁺				
157.0		348.2	17/2 ⁺	191.2	13/2 ⁺				
172.6		959.4	27/2 ⁺	786.8	25/2 ⁺				
184.5		454.3	19/2 ⁺	269.8	15/2 ⁺				
198.5		546.7	21/2 ⁺	348.2	17/2 ⁺				
210.5		1278.4	31/2 ⁺	1068.1	29/2 ⁺				
230.0		684.3	23/2 ⁺	454.3	19/2 ⁺				
240.1		786.8	25/2 ⁺	546.7	21/2 ⁺				
249.4		1639.3	35/2 ⁺	1389.2	33/2 ⁺				
275.1		959.4	27/2 ⁺	684.3	23/2 ⁺				
281.2		1068.1	29/2 ⁺	786.8	25/2 ⁺				
292.7		2040.9	39/2 ⁺	1748.6	37/2 ⁺				
319		1278.4	31/2 ⁺	959.4	27/2 ⁺				
321		1389.2	33/2 ⁺	1068.1	29/2 ⁺				
334.8		2480.1	43/2 ⁺	2145.4	41/2 ⁺				
360		1748.6	37/2 ⁺	1389.2	33/2 ⁺				
361		1639.3	35/2 ⁺	1278.4	31/2 ⁺				
378.2		2955.4	47/2 ⁺	2577.3	45/2 ⁺				
396.9		2145.4	41/2 ⁺	1748.6	37/2 ⁺				
401.1		2040.9	39/2 ⁺	1639.3	35/2 ⁺				
431.9		2577.3	45/2 ⁺	2145.4	41/2 ⁺				
439.0		2480.1	43/2 ⁺	2040.9	39/2 ⁺				
465.5		3042.8	49/2 ⁺	2577.3	45/2 ⁺				
475.3		2955.4	47/2 ⁺	2480.1	43/2 ⁺				
497.6		3540	53/2 ⁺	3042.8	49/2 ⁺				
508.6		3464.0	51/2 ⁺	2955.4	47/2 ⁺				
527.5		4068	57/2 ⁺	3540	53/2 ⁺				
540.1		4004	55/2 ⁺	3464.0	51/2 ⁺				

† From 1983Ku05, except where noted.

‡ From 1958Ne03.

From 1958Ne03 (pc).

@ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

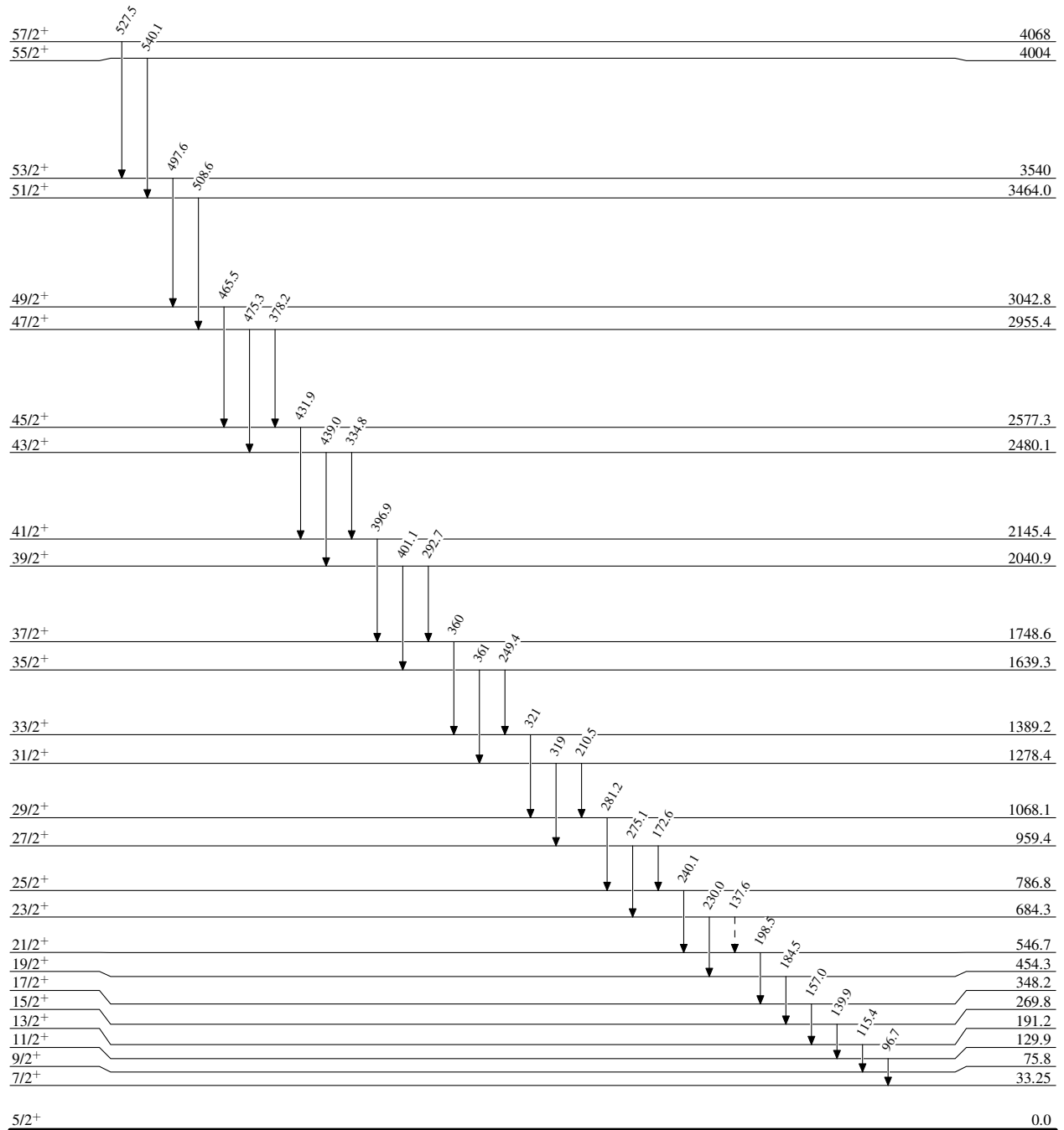
& Placement of transition in the level scheme is uncertain.

Coulomb excitation 1983Ku05,1980Si16,1958Ne03

Legend

Level SchemeIntensities: Relative I_γ

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



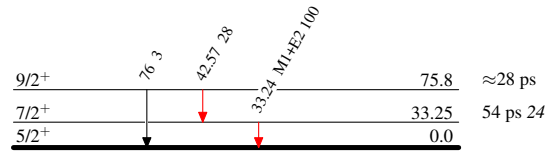
≈ 28 ps
54 ps 24

 $^{237}_{93}\text{Np}_{144}$

Coulomb excitation 1983Ku05,1980Si16,1958Ne03Level Scheme (continued)Intensities: Relative I_γ

Legend

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

 $^{237}_{93}\text{Np}_{144}$