^{14}N(p,d)   1966Ba44,1975Ro27

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, C. G. Sheu and J. E. Purcell	NDS 198,1 (2024)	1-Aug-2024

1960ChZZ, 1961Ma02: ^{14}N(p,pn) E=0.4-6.2 GeV; measured activation σ.

1961Po09: ^{14}N(p,^{13}N) E=18 MeV; analyzed decay and hyperfine structure. Deduced J=1/2 and μ=0.321 3 (μ assumed negative).

1961Be12: ^{14}N(p,d) E=16.5-18.5 MeV; measured angular distributions for $\theta\approx10°-60°$. Observed states with $E_x\leq3.5$ MeV.

1966Ba44: ^{14}N(p,d) E=155.6 MeV; measured $\sigma(\theta)$ for θ=5° to 30°. Deduced level energies; discussed S factors.

1967Ko08: ^{14}N(p,d) E=30.3 MeV; measured $\sigma(\theta)$ for θ=10° to 160°. Deduced levels, J$^\pi$, S. ^{13}N*(0,3.51,7.38,8.93,11.80).

1971Cu01: ^{14}N(p,d) E=14.5 MeV; measured $\sigma(\theta)$ for θ=10° to 80°. Deduced ^{13}N$_{g.s.}$ S=0.83-1.3.

1973Fa10: ^{14}N(p,d) E=185 MeV; measured $\sigma(E_d,\theta)$ analyzed deep-lying hole states around E_x= 50 MeV.

1974Mu17: ^{14}N(p,pn) E=11-18 MeV; measured $\sigma(E)$.

1975Ro27: ^{14}N(p,d) E=65 MeV; measured $\sigma(E_d,\theta)$ for θ=10° to 60°. Deduced levels, optical model parameters, S.

1977Gu14: ^{14}N(p,d$_0$) E=16.2, 17.7, measured $\sigma(\theta)$.

1982Ao05: ^{14}N(pol. p,d$_0$) E=21 MeV; measured $\sigma(\theta)$ for θ=20° to 140°.

1987Va28: ^{14}N(pol. p,d$_0$) E=18.6 MeV; measured $\sigma(\theta)$.

1991Ab04: ^{14}N(p,d) E=30.3 MeV; measured $\sigma(\theta)$ for $\theta\approx20°$ to 160°. Discussed configurations.

2003Ko72: ^{14}N(p,d) E$\approx$ 6-19 MeV; measured thick target yields.

2023Ro01: ^{14}N(p,pn) E$\approx$ threshold-200 MeV; measured activation σ motivated by determining dose in proton therapy treatment.

Theory:

1969Do08: calculated $\sigma(\theta)$ at E$_p$=19,30,156 MeV.

1971Mc15: calculated $\sigma(\theta)$ at E=30 MeV.

1976Wa15: ^{14}N(p,d$_0$); analyzed d$_0$ angular distribution. Deduced S=0.504.

1977Bo42: ^{14}N(p,d) E=30.3 MeV, calculated $\sigma(\theta)$.

1978Ma34: ^{14}N(p,d) E=17.7 MeV; calculated $\sigma(\theta)$.

^{13}N Levels

E(level)	J$^{\pi}$ [@]	S [@]	Comments
0 [†‡]	1/2$^-$	0.8 2	μ=0.321 3 (1961Po09)
			S: See also S=0.45 (1975Ro27).
2.36×10^3	(1/2$^+$)		
3.50×10^{3} [†‡]	(3/2$^-$)	0.25 5	E(level): Observed in (1966Ba44: E_x=3.6 MeV *1* likely unresolved states).
			S: See also S=0.21 (1975Ro27).
3.55×10^{3} [†#]			
6.38×10^3	(5/2$^+$)		
7.38×10^{3} [†‡#]	(5/2$^-$)	1.5 3	E(level): Observed in (1966Ba44: E_x=7.4 MeV *1*).
			S: See also S=1.92 (1975Ro27).
8.92×10^{3} [†‡#]	(1/2$^-$)	0.30 6	E(level): Observed in (1966Ba44: E_x=9.0 MeV *2*).
			S: See also S=0.68 (1975Ro27).
11.86×10^{3} [‡#]	(3/2$^-$)	0.65 2	E(level): Observed in (1966Ba44: E_x=11.9 MeV *2*, likely unresolved states).
			S: See also S=1.29 (1975Ro27).
14.0×10^3			E(level): Observed in (1966Ba44: E_x=14.0 MeV *3*, likely unresolved states).

[†] Observed in (1966Ba44), see discussion on spectroscopic factors.

[‡] Observed in (1975Ro27), see discussion on spectroscopic factors.

[#] Reported in (1991Ab04).

[@] From (1967Ko08): J From theory, S from DWBA.