Table 13.22 from (1981AJ01): ^{13}N levels from ^{12}C(p, p), ^{12}C(p, p′) and ^{12}C(p, α) [a]

E_p (MeV ± keV)	^{13}N* (MeV)	$\Gamma_{c.m.}$ (keV)	l_p	J^π		Refs.
					[d]	
0.461 ± 3	2.369 [b]	31 [b]	0	$\frac{1}{2}^+$	$\theta^2 = 0.54$	A, (1979KR18)
1.686 ± 6	3.499 [b,c]	63 [b]	1	$\frac{3}{2}^-$	0.031	A
1.734 ± 6	3.543 [b,c]	74 [b]	2	$\frac{5}{2}^+$	0.21	A
4.808 ± 10	6.378	11	2	$\frac{5}{2}^+$	0.0031	A
5.370 ± 10	6.896	115 ± 5	2	$\frac{3}{2}^+$	0.13	A
5.65 ± 10	7.155	9 ± 0.5	4	$\frac{7}{2}^+$	0.016	A
5.891	7.38	75 ± 5	3	$\frac{5}{2}^-$	0.069	A
6.5	7.9	≈ 1500	2	$\frac{3}{2}^+$	0.14	A
7.54	8.90	230	1	$\frac{1}{2}^-$	0.02	A
8.18	9.49	30	1	$\frac{3}{2}^-$	0.001	A
9.13	10.36	30	3	$\frac{5}{2}^-$		A
9.13	10.36	76	3	$\frac{7}{2}^-$		A
					$\Gamma_p/\Gamma =$	
10.35 ± 50	11.49	430 ± 35	2	$\frac{5}{2}^+$	0.70 ± 0.05	A
10.58 ± 30	11.70	115 ± 30	3	$\frac{5}{2}^-$	0.60 ± 0.40	A
10.62 ± 40	11.74	250 ± 30	2	$\frac{3}{2}^+$	0.30 ± 0.05	A
10.62 ± 50	11.74	530 ± 80	1	$\frac{3}{2}^-$	0.55 ± 0.05	A
10.75 ± 40	11.86	380 ± 50	0	$\frac{1}{2}^+$	0.35 ± 0.05	A
11.05 ± 50	12.13	250 ± 30	3	$\frac{7}{2}^-$	0.30 ± 0.05	(1973ME03)
12.5	13.5	≈ 500				(1961NA02)
13.13 ± 20 [a]	14.05	180 ± 35	2	$\frac{3}{2}^+; T = \frac{1}{2}$	0.29 ± 0.07	(1976ME18, 1969LE18)
14.23075 ± 0.2	15.06447 [e]	0.932 ± 0.028 [l]	1	$\frac{3}{2}^-; T = \frac{3}{2}$		A, Table 13.7, (1980TH05)
15.24 ± 40 [f]	15.99	135 ± 90	4	$\frac{7}{2}^+; T = \frac{1}{2}$	0.05 ± 0.04	(1976ME18, 1969LE18)
15.2	16.0	≈ 500				A
16.8	17.4				[f]	(1976BE28)
17.58 ± 30	18.15	322 ± 75	2	$\frac{3}{2}^+; T = \frac{1}{2}$	0.08 ± 0.02	(1976ME18)
17.60 ± 20	18.17	225 ± 50	1	$\frac{1}{2}^-; T = \frac{1}{2}$	0.24 ± 0.06	(1976ME18, 1969LE18)
17.857 ± 5 [a]	18.406	66 ± 8	2	$\frac{3}{2}^+; T = \frac{3}{2}$	[g]	A, (1976BE28, 1969LE18)
18.460 ± 10 [a]	18.961	23 ± 5		$\frac{3}{2}^-$ or $\frac{7}{2}^+; T = \frac{3}{2}$	[g]	A, (1976BE28, 1969LE18)
19.40 [j]	19.83	1000	3	$\frac{5}{2}^-; T = \frac{1}{2}$		A, (1969LE18)
19.46	19.88	750	4	$\frac{7}{2}^+; T = \frac{1}{2}$		A, (1979GA13)
19.8	20.2	1000		$\frac{5}{2}^-$	[g]	(1976BE28, 1979GA13)

Table 13.22 from (1981AJ01): ^{13}N levels from ^{12}C(p, p), ^{12}C(p, p′) and ^{12}C(p, α) [a] (continued)

E_p (MeV ± keV)	^{13}N* (MeV)	$\Gamma_{c.m.}$ (keV)	l_p	J^π		Refs.
20.6 ± 300	20.9	1200		$\frac{1}{2}^+$	[f,g]	(1973ME12, 1976BE28, 1979GA13) [i]
21.1	21.4	750		$\frac{5}{2}^-$		(1979GA13)
21.4	21.7			$\frac{3}{2}^+$		A, (1979GA13)
22.2 ± 500 [k]	22.4	≈ 1000		$\frac{1}{2}^+$		A, (1979GA13)
24.0	24.1	≤ 500				A
25.7	25.6			$(\frac{3}{2})^-$		A
27.02	26.84					A
32	31				[j]	(1976FE1C)

A: See references listed in Table 13.27 in (1976AJ04).
[a] See also Tables 13.25 in (1970AJ04) and 13.27 in (1976AJ04).
[b] An R-matrix analysis by (1976ME22) leads to $E_x = 2.367$, 3.501 and 3.547 MeV, and $\Gamma_{c.m.} = 33$, 55 and 50 keV for these states. (1976ME22) also find that $^{13}N_{g.s.}$ has an appreciable effect on the low energy scattering.
[c] See also (1976MA55).
[d] A dispersion analysis leads to a spectroscopic factor of 0.53 ± 0.08 for $^{13}N_{g.s.}$ (1977ME05).
[e] See also (1976IK01).
[f] Resonance in yield of 12.7 MeV γ-rays (1976BE28).
[g] Resonance in yield of 15.1 MeV γ-rays (1976BE28).
[h] See however (1976BE28).
[i] See also (1976FE1C).
[j] Resonance in yield of 4.4 MeV γ-rays (1976FE1C).
[k] A $\frac{3}{2}^+$ state is indicated in this region by the work of (1976GA27).
[l] $\Gamma_p = 263 \pm 15$ eV (1980TH05).