Table 13.18 from (1986AJ01): ^{13}N levels from ^{12}C(p, p), ^{12}C(p, p′), ^{12}C(p, α) [a]

$E_{\rm p}$ (MeV ± keV)	^{13}N* (MeV)	$\Gamma_{\rm c.m.}$ (keV)	$l_{\rm p}$	J^π	[b]
0.461 ± 3	2.369 [c]	31 [c]	0	$\frac{1}{2}^+$	$\theta^2 = 0.54$
1.686 ± 6	3.499 [c]	60 [c]	1	$\frac{3}{2}^-$	0.031
1.734 ± 6	3.543 [c]	50 [c]	2	$\frac{5}{2}^+$	0.21
4.808 ± 10	6.378	11	2	$\frac{5}{2}^+$	0.0031
5.370 ± 10	6.896	115 ± 5	2	$\frac{3}{2}^+$	0.13
5.65 ± 10	7.155	9 ± 0.5	4	$\frac{7}{2}^+$	0.016
5.891	7.38	75 ± 5	3	$\frac{5}{2}^-$	0.069
6.5	7.9	≈ 1500	2	$\frac{3}{2}^+$	0.14
7.54	8.90	230	1	$\frac{1}{2}^-$	0.02
8.18	9.49	30	1	$\frac{3}{2}^-$	0.001
9.13	10.36	30	3	$\frac{5}{2}^-$	
9.13	10.36	76	3	$\frac{7}{2}^-$	
10.35 ± 50	11.49	430 ± 35	2	$\frac{5}{2}^+$	$\Gamma_{\rm p}/\Gamma = 0.70 \pm 0.05$
10.58 ± 30	11.70	115 ± 30	3	$\frac{5}{2}^-$	0.60 ± 0.04
10.62 ± 40	11.74	250 ± 30	2	$\frac{3}{2}^+$	0.30 ± 0.05
10.62 ± 50	11.74	530 ± 80	1	$\frac{3}{2}^-$	0.55 ± 0.05
10.75 ± 40	11.86	380 ± 50	0	$\frac{1}{2}^+$	0.35 ± 0.05
11.05 ± 50	12.13	250 ± 30	3	$\frac{7}{2}^-$	0.30 ± 0.05
12.5	13.5	≈ 500			
13.13 ± 20	14.05	180 ± 35	2	$\frac{3}{2}^+; T = \frac{1}{2}$	0.29 ± 0.07
14.23075 ± 0.2	15.06457 ± 0.4	0.932 ± 0.028 [d]	1	$\frac{3}{2}^-; T = \frac{3}{2}$	
15.24 ± 40 [e]	15.99	135 ± 90	4	$\frac{7}{2}^+; T = \frac{1}{2}$	0.05 ± 0.04
15.2	16.0	≈ 500			
16.8 [e]	17.4				
17.58 ± 30	18.15	322 ± 75	2	$\frac{3}{2}^+; T = \frac{1}{2}$	0.08 ± 0.02
17.60 ± 20	18.17	225 ± 50	1	$\frac{1}{2}^-; T = \frac{1}{2}$	0.24 ± 0.06
17.857 ± 5 [f]	18.406	66 ± 8	2	$\frac{3}{2}^+; T = \frac{3}{2}$	
18.460 ± 10 [f]	18.961	23 ± 5		$\frac{3}{2}^-$ or $\frac{7}{2}^+$; $T = \frac{3}{2}$	

Table 13.18 from (1986AJ01): ^{13}N levels from ^{12}C(p, p), ^{12}C(p, p′), ^{12}C(p, α) [a] (continued)

E_p (MeV ± keV)	^{13}N* (MeV)	$\Gamma_{c.m.}$ (keV)	l_p	J^π	
19.40 [g]	19.83	1000	3	$\frac{5}{2}^-; T = \frac{1}{2}$	
19.46	19.88	750	4	$\frac{7}{2}^+; T = \frac{1}{2}$	
19.8 [f]	20.2	1000		$\frac{5}{2}^-$	
20.6 ± 300 [e,f]	20.9	1200		$\frac{1}{2}^+$	
21.1	21.4	750		$\frac{5}{2}^-$	
21.4	21.7			$\frac{3}{2}^+$	
22.2 ± 500 [h]	22.4	≈ 1000		$\frac{1}{2}^+$	
24.0	24.1	≤ 500			
25.7	25.6			$(\frac{3}{2}^-)$	
27.02	26.84				
32 [g]	31				

[a] For references see Tables 13.22 in (1981AJ01) and 13.27 in (1976AJ04).

[b] A dispersion analysis leads to a spectroscopic factor of 0.53 ± 0.08 for $^{13}N_{g.s.}$.

[c] The older values for ^{13}N*(3.50, 3.54) have been reanalyzed by (1980BA54). An R-matrix analysis had led to $E_x = 2.367$, 3.501 and 3.547 MeV, and $\Gamma_{c.m.} = 33$, 55 and 50 keV for these states. $^{13}N_{g.s.}$ appears to have an appreciable effect on the low-energy scattering: see (1981AJ01). (1984BUZO; prelim.) report $E_{res} = 1.74 \pm 0.01$ MeV, $\Gamma = 50$ keV.

[d] $\Gamma_p = 263 \pm 15$ eV (1980TH05). See discussion in (1981BR24): if the ^{12}C nucleus were part of an atom the width of the resonance would be smeared out by an amount of the order of ≈ 0.5 keV (A.M. Lane, private communication). See also Table 13.6.

[e] Resonance in yield of 12.7 MeV γ-rays.

[f] Resonance in yield of 15.1 MeV γ-rays.

[g] Resonance in yield of 4.4 MeV γ-rays.

[h] A $\frac{3}{2}^+$ state is indicated in this region.