

Table 14.14 from (1981AJ01): Resonances in  $^{12}\text{C} + \text{d}$  <sup>a</sup>

$E_d$ (MeV $\pm$ keV)	$\Gamma_{\text{c.m.}}$ (keV)	Particles out	$^{14}\text{N}^*$ (MeV)	$J^\pi; T$
0.92	95	n, p <sub>0</sub> , p <sub>1</sub>	11.06	1 <sup>+</sup> ; 0
1.13		p <sub>0</sub> , p <sub>1</sub>	11.24	T = 1
1.19	190	n, p <sub>0</sub> , p <sub>1</sub> , d	11.29	2 <sup>-</sup> ; 0
1.23		p <sub>0</sub>	11.33	(3 <sup>+</sup> )
1.30	30	n, p <sub>0</sub> , p <sub>1</sub> , d	11.39	1 <sup>+</sup> ; 0
1.39		p <sub>0</sub>	11.46	(2 <sup>-</sup> )
1.4495 $\pm$ 1.5	7.0 $\pm$ 0.5	p <sub>0</sub> , p <sub>1</sub> , d	11.5135	2 <sup>+</sup> , 3 <sup>+</sup>
1.55		p <sub>0</sub>	11.60	(2 <sup>-</sup> )
1.640 $\pm$ 20	150 $\pm$ 20	n, p <sub>1</sub> , d <sub>0</sub>	11.68	1 <sup>-</sup> , 2 <sup>-</sup> <sup>b</sup>
1.715 $\pm$ 6	40 $\pm$ 9	p <sub>2</sub>	11.741	1 <sup>-</sup> , 2 <sup>-</sup>
1.738 $\pm$ 6	78 $\pm$ 6	p <sub>1</sub>	11.761	3 <sup>-</sup> , 4 <sup>-</sup> , (2 <sup>-</sup> )
1.792 $\pm$ 7	119 $\pm$ 9	n, p <sub>0</sub> , p <sub>1</sub> , p <sub>2</sub> , d <sub>0</sub>	11.807	2 <sup>-</sup> , (1 <sup>+</sup> ) <sup>b</sup>
1.870 $\pm$ 6	101 $\pm$ 9	p <sub>0</sub> , p <sub>1</sub> , p <sub>2</sub>	11.874 <sup>c</sup>	2 <sup>-</sup> , (1 <sup>-</sup> )
2.250 $\pm$ 19	300 $\pm$ 30	n, p <sub>0</sub> $\rightarrow$ p <sub>3</sub> , d <sub>0</sub>	12.20	1 <sup>-</sup> , 2 <sup>-</sup> <sup>b</sup>
2.494 $\pm$ 3 <sup>d</sup>	37 $\pm$ 4	n, p <sub>0</sub> $\rightarrow$ p <sub>3</sub> , d <sub>0</sub>	12.408	3 <sup>+</sup> , (3 <sup>-</sup> , 4 <sup>-</sup> ) <sup>b</sup>
2.506 $\pm$ 3	41 $\pm$ 4	p <sub>1</sub>	12.418	3 <sup>-</sup> , 4 <sup>-</sup> , (2 <sup>+</sup> , 3 <sup>+</sup> )
2.610 $\pm$ 20	30 $\pm$ 20	n, p <sub>1</sub> , p <sub>2</sub> , p <sub>3</sub>	12.507	(b)
2.712 $\pm$ 3	48 $\pm$ 2	(n), p <sub>0</sub> $\rightarrow$ p <sub>3</sub> , d <sub>0</sub>	12.594	3 <sup>+</sup> <sup>b</sup>
(2.817 $\pm$ 7)	27 $\pm$ 6	n, p <sub>1</sub> , p <sub>2</sub> , p <sub>3</sub> , d <sub>0</sub>	(12.684)	(b)
2.844 $\pm$ 9	43 $\pm$ 15	p <sub>2</sub> , p <sub>3</sub>	12.708	
2.940 $\pm$ 10	30 $\pm$ 10	p <sub>2</sub> , p <sub>3</sub> , d	12.790	
2.967 $\pm$ 5	37 $\pm$ 6	p <sub>1</sub>	12.813	
2.982 $\pm$ 6	11 $\pm$ 3	n, p <sub>3</sub> , d	12.826	
3.018 $\pm$ 6	78 $\pm$ 10	n, p <sub>0</sub> , p <sub>1</sub>	12.857	
3.049 $\pm$ 8	134 $\pm$ 11	p <sub>1</sub>	12.883	
3.100 $\pm$ 10	20 $\pm$ 14	p <sub>1</sub> , p <sub>2</sub> , p <sub>3</sub> , d	12.927	(3 <sup>-</sup> , 4 <sup>-</sup> )
3.39 $\pm$ 12	47 $\pm$ 15	n, p <sub>2</sub> , p <sub>3</sub> , d	13.17	(0 <sup>-</sup> , 1 <sup>-</sup> )
3.97 $\pm$ 30	< 200	p <sub>0</sub> , p <sub>2</sub> , p <sub>3</sub> , (d)	13.67	(2 <sup>+</sup> , 3 <sup>+</sup> )
4.02 <sup>+20</sup> <sub>-10</sub>	$\approx$ 235	n, (p), d	13.71	(1 <sup>+</sup> )
4.40		p <sub>0</sub> $\rightarrow$ p <sub>3</sub> , d	14.04	

Table 14.14 from (1981AJ01): Resonances in  $^{12}\text{C} + \text{d}$  <sup>a</sup> (continued)

$E_d$ (MeV $\pm$ keV)	$\Gamma_{\text{c.m.}}$ (keV)	Particles out	$^{14}\text{N}^*$ (MeV)	$J^\pi; T$
4.55		n, p <sub>2</sub> , d	14.17	
4.80		p <sub>0</sub> , p <sub>2</sub> , d	14.38	
5.17		d	14.70	
5.34	$\approx 100$	p <sub>0</sub> $\rightarrow$ p <sub>3</sub> , d, $\alpha$	14.84	
5.65		d	15.11	
5.83		p <sub>1</sub> , p <sub>3</sub> , d	15.26	
6.07		p <sub>1</sub> , p <sub>2</sub> , $\alpha$	15.47	
6.3		p <sub>0</sub> , p <sub>3</sub> , d, $\alpha$	15.7	
7.2		$\alpha$	16.4	
7.6 <sup>e</sup>	$\approx 300$	$\alpha_2$	16.8	4 <sup>+</sup> <sup>f</sup>
7.8	$\approx 100$	$\alpha_2$	16.9	(5 <sup>-</sup> )
8.1	$\approx 300$	p <sub>0</sub> , p <sub>2</sub> , d, $\alpha_2$	17.2	4 <sup>+</sup>
9.1	( $\approx 300$ )	$\alpha_2$	18.1	(1 <sup>-</sup> , 2 <sup>+</sup> )
9.2	$\approx 600$	$\alpha_2$	18.1	4 <sup>+</sup>
9.3	( $\approx 400$ )	$\alpha_2$	18.2	3 <sup>-</sup>
9.5	( $\approx 300$ )	$\alpha_2$	18.4	3 <sup>-</sup>
9.61	$\approx 60$	$\alpha_2$	18.50	5 <sup>-</sup>
10.0 <sup>g</sup>	( $\approx 400$ )	$\alpha_2$	18.8	4 <sup>+</sup>
11.5	( $\approx 500$ )	$\alpha_2, \alpha_3$	20.1	1 <sup>-</sup>
12.3	$\approx 600$	$\alpha_2$	20.8	5 <sup>-</sup>
12.3	( $\approx 500$ )	$\alpha_2$	20.8	(3 <sup>-</sup> , 4 <sup>+</sup> )
12.9	( $\approx 1000$ )	$\alpha_2$	21.3	4 <sup>+</sup>
13.1	( $\approx 500$ )	$\alpha_2$	21.5	3 <sup>-</sup>
13.4	$\approx 200$	$\alpha_2$	21.7	5 <sup>-</sup>
14.29 $\pm$ 100	610 $\pm$ 100	$\alpha_2$	22.5	5 <sup>-</sup> <sup>h</sup>
15.28 $\pm$ 100	500 $\pm$ 100	$\alpha_2$	23.3	5 <sup>-</sup> <sup>h</sup>

- <sup>a</sup> For the references for each of the resonances, see [Table 14.15 in \(1976AJ04\)](#).
- <sup>b</sup> See also [\(1976BO1Q\)](#); prelim.)
- <sup>c</sup> [\(1974GM01\)](#) also report a state at 12.05 MeV with  $\Gamma = 190$  keV seen as a structure in the  $p_0$  yield.
- <sup>d</sup> A study of this resonance shows that either f-shell components are present in the wave function or that the coupling is very strong or that both effects are present [\(1974DA06\)](#).
- <sup>e</sup> For all states reported by [\(1972SM07\)](#) see their discussion of the  $S$ -matrix analysis of their  $\alpha_2$  data: the resonances shown below correspond to one possible (albeit the most reasonable) solution. The  $\alpha_2$  channel is sensitive only to  $^{14}\text{N}$  states that have natural parity and are isospin mixed.
- <sup>f</sup> These, and all the states shown below, are isospin mixed. [\(1972SM07\)](#) notes that the average spacing of these states, as observed via the  $\alpha_2$  channel,  $D \approx 400$  keV, as is the average width of the states, so  $\Gamma \approx D$ .
- <sup>g</sup> See also [Table 14.10 in \(1970AJ04\)](#) for states reported at  $^{14}\text{N}^*(17.2, 19.6, 20.4)$ .
- <sup>h</sup> These states appear to be an isospin mixed pair with  $\langle H_c \rangle \geq 40$  keV [\(1974JO01\)](#).