

Table 12.23 from (1975AJ02):  
 Energy levels of  $^{12}\text{C}$  from  $^{12}\text{C}(^3\text{He}, ^3\text{He})^{12}\text{C}$ ,  $^{12}\text{C}(\alpha, \alpha)^{12}\text{C}$  and  $^{14}\text{N}(\text{d}, \alpha)^{12}\text{C}$

$E_x$ <sup>a,b</sup> (MeV $\pm$ keV)	$L$ <sup>b</sup>	$E_x$ <sup>a,c</sup> (MeV $\pm$ keV)	$\Gamma$ <sup>c</sup> (MeV)	$J^\pi; T$ <sup>d</sup>
0	0	0		$0^+; 0$
$4.4422 \pm 1.5$ <sup>e</sup>	2	4.44		$2^+; 0$
7.67		7.67		$0^+; 0$
9.64	3	$9.642 \pm 14$ <sup>j</sup>	$0.030 \pm 0.008$ <sup>j</sup>	$3^-; 0$
10.84	f	$10.84$ <sup>f</sup>		$1^-; 0$
11.83	f	$11.83$ <sup>f</sup>		$2^-; 0$
12.71	0	$12.71 \pm 130$ <sup>f,k</sup>		$1^+; 0$
		$13.29$ <sup>l</sup>	$0.355 \pm 0.050$ <sup>l</sup>	
14.08		$14.08 \pm 30$ <sup>h</sup>		$4^+; 0$
15.11	0			$1^+; 1$
		$15.62 \pm 120$ <sup>h</sup>	$1.2 \pm 0.3$	
16.11	2			$2^+; 1$
$16.58$ <sup>g</sup>				$2^-; 1$
$18.40 \pm 60$ <sup>g</sup>	f	$18.39 \pm 80$ <sup>f</sup>		$0^-$
$18.80$ <sup>g</sup>	f			$2^+$
		$19.20 \pm 130$ <sup>f,i</sup>	$0.39 \pm 0.10$	
$19.58 \pm 60$ <sup>g</sup>		$20.3 \pm 300$ <sup>f,i</sup>	$0.45 \pm 0.15$	
		$21.81 \pm 80$ <sup>f,i</sup>	$0.43 \pm 0.08$	
		$22.70 \pm 80$ <sup>f,i</sup>		
		$24.24 \pm 80$ <sup>f,i</sup>	$0.18 \pm 0.08$	

<sup>a</sup> When no errors are shown, values are from [Table 12.8](#).

<sup>b</sup>  $E(^3\text{He}) = 49.8$  MeV ([1968BA1E](#), [1969BA06](#)).

<sup>c</sup>  $E_\alpha = 90$  MeV and  $E_d = 52$  MeV ([1972FA07](#)).

<sup>d</sup> Best values. <sup>e</sup> ([1971ST22](#)).

<sup>f</sup> Angular distribution not obtained.

<sup>g</sup> ( $T = 1$ ) ([1969BA06](#)).

<sup>h</sup> ([1972FA07](#)) suggests  $J^\pi = 3^-$  for  $^{12}\text{C}^*(14.08)$  and  $4^+$  for  $^{12}\text{C}^*(15.6)$ .

<sup>i</sup> Decays predominantly by  $\alpha$ -emission.

<sup>j</sup> ([1956DO41](#)):  $^{14}\text{N}(\text{d}, \alpha)^{12}\text{C}$ .

<sup>k</sup>  $12.7 \pm 0.07$  MeV ([1965PE17](#)):  $^{14}\text{N}(\text{d}, \alpha)^{12}\text{C}$ .

<sup>l</sup> ([1965SC12](#)):  $^{14}\text{N}(\text{d}, \alpha)^{12}\text{C}$ .