Table 12.30 from (2017KE05): ^{12}C levels from ^{12}C(p, p′)^{12}C* [a]

E_x (MeV ± keV)	Γ (MeV)	J^π; T	E_x (MeV ± keV)	Γ (MeV)	J^π; T
4.4390 ± 1.1 [b,c]	[d]	2^+; 0	(19.65 ± 50)	(0.44 ± 0.1)	$(4^+; 0)$
7.65400 ± 0.20 [e]	[g,q]	0^+; 0	20.27 ± 50 [o]	0.14 ± 0.05	
9.63 ± 40 [h]	[f,g]	3^-; 0	20.57 ± 50	0.35 ± 0.1	3^-; 1
9.75 ± 0.15 [i]	0.75 ± 0.15	2^+	21.65 ± 100	1.20 ± 0.15	3^-; 0
10.78 ± 100 [h]		1^-; 0	(21.95 ± 150)	0.8 ± 0.1	1^-; 1
12.70 ± 80 [h]	[g]		(22.36 ± 50) [o]	0.3 ± 0.05	
14.05 ± 100 [h]		4^+; 0	(22.6 ± 100) [n]	0.9 ± 0.1	1^-; 1
15.11 ± 50 [h]	[g]	1^+; 1	23.50 ± 50	0.23 ± 0.1	1^-; 1
15.4 ± 100 [j,k]	1.41 ± 0.15	2^+; 0	23.92 ± 80	0.4 ± 0.1	1^-; 1
16.11			(25.3 ± 150)	0.51 ± 0.1	1^-; 1
16.57			(25.8 ± 300)	0.75 ± 0.15	$(1^-; 1)$
18.30 ± 30 [l]	0.38 ± 0.03	$(2^+, 2^-), 3^-$	(27.0 ± 300)	1.4 ± 0.2	1^-; 1
19.4 ± 30 [m]	0.48 ± 0.04	2^-; 1	(29.4 ± 300) [p]		$(2^+; 1)$

[a] See also Tables 12.18 in (1980AJ01, 1985AJ01) for the earlier references.

[b] On the basis of angular distributions to ^{12}C*(4.4, 12.7, 15.1) for $E_p = 22.2$ to 45 MeV, it is suggested that the E2 strength is fragmented with the major concentration, corresponding to the isoscalar E2 resonance, near 28 MeV, and subsidiary strength near 32 and 42 MeV, the latter possibly a part of the isovector quadrupole resonance.

[c] This state is identified at $E_x = 4437 \pm 7$ keV (1962BR10), 4440.0 ± 0.5 keV (1967KO14), 4442.2 ± 1.5 keV (1971ST22), 4439.2 ± 0.5 keV (1974NO07), and 4439.0 ± 1.1 (1974JO14).

[d] $\tau_m = 55 \pm 7$ fsec (1968RI16): $\Gamma_\gamma = 12.0 \pm 1.5$ eV.

[e] See $E_x = 7655.9 \pm 2.5$ keV (1971ST22), 7656.2 ± 2.1 keV (1971AU16), 7655.2 ± 1.1 keV (1974JO15), and 7654.00 ± 0.20 keV (1976NO02). Using the recommended value $E_x = 7654.07 \pm 0.19$ keV from (1976NO02) gives $Q(3\alpha) = 379.33 \pm 0.20$ keV.

[f] $\Gamma(9.641) = 48 \pm 2$ keV (2013KO14).

[g] See Table 12.14. [h] (1965HA17, 1969SU03). [i] (2012FR05).

[j] $\alpha_\pi = N_{e^+ + e^-}/N_\gamma = (3.3 \pm 0.5) \times 10^{-3}$ (1993BU23).

[k] $E_x = 15.3 \pm 0.2$ MeV (1977BU19) and 15.4 ± 0.1 MeV (1979GO16); $\Gamma = 2.0 \pm 0.2$ MeV (1977BU19) and 1.41 ± 0.15 MeV (1979GO16).

[l] $E_x = 18.20 \pm 0.10$ MeV (1965HA17, 1969SU03), 18.35 ± 0.05 MeV (1974BU17), 18.35 ± 0.03 MeV (1977BU19), and 18.30 ± 0.03 MeV (1983JO08); $\Gamma = 0.35 \pm 0.10$ MeV (1977BU19) and 0.38 ± 0.03 MeV (1983JO08). $J^\pi = 2^+$, 3^- (1977BU19) and 2^- (1983JO08).

[m] $E_x = 19.35 \pm 0.10$ MeV (1965HA17, 1969SU03), 19.40 ± 0.05 MeV (1977BU19), and 19.40 ± 0.03 MeV (1983JO08); $\Gamma = 0.53 \pm 0.1$ MeV (1977BU19) and 0.48 ± 0.04 MeV (1983JO08).

[n] (1977BU19): $E_p = 45$ and 155 MeV.

[o] Only at 45 MeV (1977BU19). [p] Only at 155 MeV (1977BU19).

[q] $\Gamma_\pi/\Gamma = (6.0 \pm 1.1) \times 10^{-6}$ (1977RO05) and $(7.1 \pm 0.8) \times 10^{-6}$ (1977AL31).