Table 12.34 from (2017KE05): States of ^{12}C from ^{12}C(^{3}He, ^{3}He), ^{12}C(α, α) and ^{14}N(d, α) [a]

E_x [b,c,d] (MeV ± keV)	Γ [d] MeV	Γ_{α_0}/Γ [p]	L [c,d] (MeV)	E_x [b,g] (MeV ± keV)	Γ (MeV)	$J^\pi; T$ [u]
0			0	0		$0^+; 0$
4.4422 ± 1.5 [e]			2	4.44 [h,y]		$2^+; 0$
7.67				7.67 [h]		$0^+; 0$
9.64			3	9.642 ± 14 [h,i,z]	0.030 ± 0.008 [i]	$3^-; 0$
				9.84 ± 60 [†]	1.01 ± 0.15	2^+
				9.93 ± 30 [‡]	2.71 ± 0.08	0^+
10.84			[j]	10.96 ± 0.10 [§]		$1^-; 0$ [v]
11.83			[j]	11.83 [j]		$2^-; 0$
12.71			0	12.7 ± 70 [j,k]		$1^+; 0$
				13.29 [l]	0.355 ± 0.050 [l]	
				13.3 ± 200 [#]	1.7 ± 0.2	(4^+)
14.08		0.20 ± 0.10		14.08 ± 30 [m]		4^+ [n,v]; 0
15.11 [f]		< 0.08	0			$1^+; 1$
15.2 ± 300 [d]	1.8 ± 0.3		2	15.5 ± 100 [o,q]	2.1 ± 0.3 [o]	$(2^+; 0)$ [o]
16.11 [f]		0.18 ± 0.10	2			$2^+; 1$
16.58 [f]						$2^-; 1$
18.40 ± 60 [c,d,f]	0.4 ± 0.1	0.25 ± 0.10 [w]	2	18.5 ± 150 [j,o,q]		(2^+) [d]
18.9 ± 150 [d,f]	0.7 ± 0.15		2			(2^+) [d,&]
				19.50 ± 100 [o,r]	≈ 0.25 [r]	$(1, 2, 3)^+$ [r]
19.58 ± 60 [c,f]		0.21 ± 0.10 [x]				
				20.55 ± 100 [r]	≈ 0.2 [r]	$(2, 3)^+$ [r]
21.3 ± 150 [d,s]	1.4 ± 0.2 [s]		2	21.65 ± 100 [j,o,p,q]	0.43 ± 0.08 [g,s]	2^+ [d,v]
		[x]		22.35 ± 100 [o,r]	≈ 0.25	2^+ [d,r]
				22.4 ± 200		(5^-)
23.5 ± 200 [d]	0.6 ± 0.2		2	23.9 ± 100 [j,r,t]	≈ 0.4	
25.9 ± 300 [d]	2.2 ± 0.3	[x]	2	[q]		(2^+) [d]
28.8 ± 400 [d]	2.7 ± 0.4		2			(2^+) [d]

[a] See also Table 12.23 in (1975AJ02). [b] When no errors are shown, values are from Table 12.8 of (1980AJ01).
[c] $E(^3\text{He}) = 49.8$ MeV (1969BA06). [d] $E(^3\text{He}) = 130$ MeV (1977BU03).
[e] (1971ST22). [f] $T = 1$ (1969BA06).
[g] (1972FA07): $E_\alpha = 90$ MeV and $E_\text{d} = 52$ MeV; above $E_x = 15.5$ values are taken from other references, see footnotes.
[h] See Table 12.8 of (1980AJ01). [i] (1956DO41): ^{14}N(d, α)^{12}C. [j] Angular distribution not obtained.
[k] (1965PE17): ^{14}N(d, α)^{12}C. [l] (1965SC12): ^{14}N(d, α)^{12}C; see also (1965BR08).
[m] (1972FA07) suggests $J^\pi = 3^-$ for ^{12}C*(14.08) and 4^+ for ^{12}C*(15.6).

[n] (1977MC07): the decay is $(9 \pm 3)\%$ to $^{8}\mathrm{Be}_{\mathrm{g.s.}}$ [this branching ratio is somewhat uncertain because there may be an appreciable effect due to continuum breakup].
[o] (1975BU1F, 1977BU19): $E_{\alpha} = 60$ MeV. [p] From (^{3}He, ^{3}He)^{12}C* $\rightarrow$ ^{8}Be + α (2014WH02).
[q] (1976KN05): $E_{\alpha} = 150$ MeV. [r] (1976VA07): $E_{\mathrm{d}} = 40$ MeV.
[s] Possibly unresolved states with $\Gamma = 1.4 \pm 0.2$ MeV and $\Gamma = 0.43 \pm 0.08$ MeV. [t] Weakly populated.
[u] Best values: see Table 12.7 of (1980AJ01) when other footnotes are not given. [v] (1978RI03): $E_{\alpha} = 104$ MeV.
[w] Corresponds to $E_{\mathrm{x}} = 18.35$ MeV; $J^{\pi} = 3^{-}$ state (2014WH02).
[x] (2014WH02) report states at $E_{\mathrm{x}} = 19.7$, 22.2 and 25.1 MeV.
[y] B(E2) $= 37 \pm 1\ e^2 \cdot \mathrm{fm}^4$ (2011IT08). [z] B(E3) $= 251 \pm 10\ e^2 \cdot \mathrm{fm}^6$ (2011IT08).
[†] B(E2) $= 1.6 \pm 0.2\ e^2 \cdot \mathrm{fm}^4$ (2011IT08); see also (2012FR05) who simultaneously fit (2012FR05) and (2009FR07: (p, p′)) and find $E_{\mathrm{x}} = 9.75 \pm 0.15$ MeV and $\Gamma = 0.75 \pm 0.15$ MeV.
[‡] (2011IT08) suggested a 0_3^+ and 0_4^+ doublet with $E_{\mathrm{x}} = 9.04 \pm 0.09$ MeV and $\Gamma = 1.45 \pm 0.18$ MeV and $E_{\mathrm{x}} = 10.56 \pm 0.06$ MeV and $\Gamma = 1.42 \pm 0.08$ MeV, respectively. See other values in (1998YO02, 2003JO07).
[§] (1998YO02). [#] (2011FR02). Possible rotational band member with $J^{\pi} = 0_2^+, 2_2^+$ states.
[&] (1987KI16): ^{12}C(α, α').