

Table 12.17 from (1980AJ01): Summary of recent $^{12}\text{C}(p, p)$, $^{12}\text{C}(d, d)$, $^{12}\text{C}(^3\text{He}, ^3\text{He})$ and $^{12}\text{C}(\alpha, \alpha)$ angular distributions ^a

(a) $^{12}\text{C}(p, p)$ measurements

E_p (MeV)	Angular distributions to ^{12}C	Refs.
1.5 → 4.0	g.s.	(1976CU08, 1978CU04)
5.55 → 6.15	g.s.	(1974AL31)
5.65, 8.6	g.s.	(1976KO36)
6	g.s., 4.4	(1975DE26, 1977SA1B)
18.5 → 35.3	g.s., 4.4	(1975DE32)
19 → 23	g.s., 4.4, 7.7, 9.6, 12.7	(1976GA1L, 1977GA1G)
$E_{\bar{p}} = 22.3, 26.7, 30.5$	12.71	(1974AM05)
22.5 → 45	g.s., 4.4, 12.7, 15.1	(1975GE15, 1975SP07, 1976KN1E)
$E_{\bar{p}} = 30.4$	g.s., 4.4, 7.7, 9.6	(1972GR02)
35.2	g.s.	(1977CO1L)
$E_{\bar{p}} = 36.2$	g.s. (small θ)	(1978BE49)
40	g.s.	(1979BO03)
45	see Table 12.18	(1977BU19)
$E_{\bar{p}} = 50, 65$	12.7, 15.1	(1978HO11)
61.9	12.7, 15.1	(1974AM05)
$E_{\bar{p}} = 65$	4.4, 15.4, 16.1	(1978HO11)
122	12.7, 15.1	(1977CO1T)
155	see Table 12.18	(1977BU19)
185	g.s., 4.4, 9.6	(1979IN01)
0.8 GeV	g.s., 4.4, 7.7, 9.6, 14.1, 15.1	(1977BL09, 1978BL02, 1979MO1E)
$E_{\bar{p}} = 0.8$ GeV	g.s., 4.4, 12.7, 15.1	(1978HO05, 1978RA08, 1978RA17, 1979GL1C, 1979LI03)
1 GeV	g.s.	(1976AL1G)

(b) $^{12}\text{C}(d, d)$ measurements

E_d (MeV)	^{12}C states	Refs.
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2.61 → 2.82	g.s.	(1974DA06)
$E_d = 15$	g.s.	(1974BU06)
24.1 → 28.8	4.4, 12.7, 15.1, 16.1	(1977LI02)
26	9.6	(1979HE06)
28	g.s.	(1970BU08)
$E_d = 29.5$	g.s.	(1977PE07)
57	g.s., 4.4, 7.7, 9.6, 12.7	(1977TOZY)
60.6, 77.3, 90	g.s., 4.4, 7.7, 9.6, 14.1	(1975AS06)
70	g.s., 4.4, 9.6, 18.4	(1975CH1K, 1975CH1L, 1977CH1L)

(c) $^{12}\text{C}(^3\text{He}, ^3\text{He})$ measurements

$E(^3\text{He})$ (MeV)	^{12}C states	Refs.
18, 20, 22, 24.5	g.s., 4.4	(1976MA26, 1978AD01)
$E(^3\text{He}) = 20.5, 26.6, 31.7$	g.s.	(1977KA25)
$E(^3\text{He}) = 32.6$	g.s., 4.4	(1975BU11)
39.7	g.s.	(1977BA05)
44	17.76	(1976CE02)
44.04	g.s.	(1979GO07)
70	g.s.	(1976DI05) ^b
82.1	g.s., 4.4, 7.7, 9.6	(1976KO36, 1976TA12)
130	See Table 12.19	(1977BU03)
132	g.s.	(1978CH1P)

(d) $^{12}\text{C}(\alpha, \alpha)$ measurements

E_α (MeV)	^{12}C states	Refs.
3.0 → 10.0	g.s.	(1975DA10)
4.0 → 13.3	g.s.	(1972MA01)
8.3 → 10.5	g.s., 4.4	(1971OP01, 1973MA03)
10.4 → 19.7	g.s., 4.4, 7.7	(1978AM1B, 1979AMZU)
15.77 → 20.14	g.s.	(1973LA16)
16.95	7.7	(1976GL1D)
20.2 → 23.3	g.s.	(1977EN01)

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24	g.s., 4.4, 7.7, 9.6	(1974FE08)
25.3	4.4	(1978AL20)
33.4, 39, 50.5	g.s., 4.4	(1976PA05)
60	g.s., 4.4, 9.6, 14.1, 15.5	(1977BU19)
65 ^c	g.s., 4.4, 9.6	(1976JA17)
100	4.4, 27	(1975RO1L)
145, 172.5	g.s.	(1976KIZP)
150	4.4, 21.3, 26.2	(1976KN05)
1.37 GeV	g.s., 4.4, 7.7, 9.6	(1976CH15)

^a See also [Tables 12.22 in \(1968AJ02\)](#) and [12.20](#) and [12.22 in \(1975AJ02\)](#).

^b No results shown.

^c Detected α -particles to $^4\text{He}^*(20.1) [0^+]$.