^{12}C(^{11}B,^{10}B),(^{12}C,^{11}C)

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, C. G. Sheu and J. E. Purcell	NDS 198,1 (2024)	1-Aug-2024

Also includes ^{12}C(^{14}N,^{13}N), ^{12}C(^{17}O,^{16}O), ^{12}C(^{18}O,^{17}O) reactions.

1967Bi06: ^{12}C(^{14}N,^{13}N) E=148 MeV; measured ^{13}N energy spectrum at θ=18° to 28° at the Yale linear accelerator. Observed states at $^{13}C^{*}$(0,3.89,7.6,9.5 MeV); discussed configurations.

1967Po13: ^{12}C(^{11}B,^{10}B) E=115.9 MeV; measured ^{10}B energy spectrum at θ_{lab}=8.5° at the Yale linear accelerator. Populated states at $^{13}C^{*}$(0,3.85,5.8 MeV).

1974An36: ^{12}C(^{11}B,^{10}B),(^{12}C,^{11}C) E=114 MeV from the AERE Harwell cyclotron; measured particle spectra, $\sigma(E,\theta)$ for $\theta\approx$10° to 60°. Deduced levels, J, π, spectroscopic amplitudes.

1978Ch16: ^{12}C(^{17}O,^{16}O),(^{18}O,^{17}O) $E_{c.m.}$=12.6-14.0 MeV from the Weizmann Institute Tandem; measured $\sigma(\theta)$ for $\theta\approx$40° to 140°; deduced reaction mechanisms, S. ^{12}C natural targets.

1979Fu04: ^{12}C(^{12}C,^{11}C) E=93.9 MeV; measured $\sigma(\theta)$. DWBA analysis.

1989HeZU: ^{12}C(^{12}C,^{11}C) E=344.5 MeV; measured $\sigma(\theta)$; deduced model parameters, spectroscopic factor. DWBA analysis.

1992Ja10: ^{12}C(^{12}C,^{11}C) E=344.5 MeV from the JULIC cyclotron; measured particle spectra, $\sigma(\theta)$ for $\theta\approx$10° to 35°. Deduced single particle transfer spectroscopic factors, products of spectroscopic factor, $C^2S_1 \cdot C^2S_2$. DWBA analyses.

2013Ca25: XUNDL dataset compiled by TUNL, 2014.

The authors measured angular distributions for the one-neutron transfer reaction ^{12}C(^{18}O,^{17}O)^{13}C. Data were analyzed via exact finite range Coupled Reaction Channel Calculations (CRCC) based on a parameter free double folding potential. This reaction study is part of a greater work, which included measurements on ^{13}C(^{18}O,^{17}O)^{14}C and ^{12}C(^{18}O,^{16}O)^{14}C. As a result, a detailed analysis of the two-neutron transfer reaction was carried out.

Beams of E(^{18}O)=84 MeV ions, from the INFN Catania impinged on 50 μg/cm^2 targets of either ^{12}C(pure) or ^{13}C(99% enrichment). Reaction products were analyzed using the MAGNEX spectrometer with θ_{lab}=8°, 12° and 18°. Angular distributions were analyzed. In the one-neutron transfer reaction a complex relation of levels in the carbon and oxygen residuals is excited which makes interpretation non-trivial.

^{13}C Levels

E(level)	J$^{\pi}$ †	L ‡	S †	Comments
0	1/2$^-$	1	0.78 *10*	E(level),J$^{\pi}$: (1974An36,1992Ja10,2013Ca25); see also (1967Bi06,1967Po13). S: From (1978Ch16: $^{13}C_{g.s.}$=$^{12}C_{g.s.}\times 1p_{1/2}$); see also 0.66 (1974An36), 0.52 (1992Ja10).
3090 *10*	1/2$^+$	0	0.90 *17*	E(level),J$^{\pi}$: (2013Ca25); see also (1974An36). S: From (1978Ch16: ^{13}C*(3.09)=$^{12}C_{g.s.}\times 2s_{1/2}$); see also 1.17 (1974An36).
3680	3/2$^-$	1	0.21	E(level),J$^{\pi}$,S: (1974An36).
3850 *10*	5/2$^+$	2	0.48	E(level),J$^{\pi}$: (2013Ca25); see also (1967Bi06,1967Po13,1974An36,1992Ja10). S: From (1992Ja10); see also 1.07 (1974An36).
6860 *10*	5/2$^+$			E(level),J$^{\pi}$: (2013Ca25).
7490	7/2$^+$		0.052	E(level),J$^{\pi}$,S: (1992Ja10).
7550	5/2$^-$		0.108	E(level),J$^{\pi}$,S: (1992Ja10).
7690 *10*	3/2$^+$	2	0.09	E(level),J$^{\pi}$: (2013Ca25); see also (1967Bi06: weak peak,1974An36: E_x=7680 keV). S: From (1974An36).
8250	3/2$^+$	2	0.67	E(level),J$^{\pi}$,S: (1974An36).
9500 *10*	9/2$^+$		0.047	E(level),J$^{\pi}$: (2013Ca25); see also (1992Ja10) and (1967Bi06: J$^{\pi}$=7/2$^-$). S: From (1992Ja10).

† From DWBA analyses of spectroscopic factors in (1974An36,1992Ja10,2013Ca25).

‡ From (1974An36).