

$^{12}\text{C}(\text{p},\pi^-)$ **1978Co15,1980Ho20**

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

1978Co15: $^{12}\text{C}(\text{p},\pi^-)$ E=613 MeV from the Saclay synchrotron Saturne; measured π yields using the SPES I high-resolution magnetic spectrometer at $\theta=5^\circ, 15^\circ, 25^\circ$ and 35° . Deduced level at $E_x=2.82$ MeV 24, enhancement at ≈ 5.5 MeV (450 keV energy resolution). No Q dependence on angular distribution.

1980Ho20: $^{12}\text{C}(\text{p},\pi^-)$ E=200 MeV from Indiana University Cyclotron Facility; measured $\sigma(\theta)$ for $^{13}\text{O}_{\text{g.s.}}$, deduced structure and reaction process interplay.

1982Ja05: $^{12}\text{C}(\text{pol. p},\pi^-)$ E=205 MeV from the Indiana University Cyclotron Facility; measured $\sigma(E(\pi))$, $\sigma(\theta)$, and A_y vs θ from $\theta(\text{c.m.})=31^\circ$ to 153° using the quadrupole-quadrupole split-pole spectrometer. Analyzed $^{13}\text{O}_{\text{g.s.}}$.

1985Bi04: $^{12}\text{C}(\text{p},\pi^-)$ E= 180, 201 MeV from the Orsay synchrocyclotron, measured $\sigma(\theta, E(\pi))$. Deduced σ_{total} .

1988Ab05: $^{12}\text{C}(\text{p},\pi^-)$ E=997(5) MeV, measured $\sigma(\theta)$ vs. π momentum from 75-950 MeV/c at $\theta=0^\circ$ and 57.8° . Used two magnetic spectrometers $\pi 1$ and $\pi 2$ with angular acceptance of 0.01 sr. Total RMS error for normalisation of the differential cross section was 6% and 11% for 0° and 57.8° , respectively.

1992Ho03: $^{12}\text{C}(\text{p},\pi^-)$ E=186, 204 MeV, $\theta(\text{c.m.})=155^\circ-180^\circ$. Observed π' s emitted in backward direction corresponding to $^{13}\text{O}_{\text{g.s.}}$.

2002Ha02: $^{12}\text{C}(\text{pol. p},\pi^-)$ E=250, 300, 350 MeV, proton polarization of about 0.7 from the atomic beam-type polarized ion source at the Research Center for Nuclear Physics in Osaka University. Measured $\sigma(\theta)$ and analyzing powers using spectrometer LAS. Focal plane detectors consisted of two vertical drift chambers and two ΔE trigger scintillators. 10% data acquisition deadtime. Most background was from μ produced from π -decay. Less than 5% overall systematic uncertainties. Comparison with DWBA.

See also (theory) ([1981Bu18](#), [1984Gu27](#), [1985Co11](#), [1991Ku07](#), [1992Be37](#), [1992No01](#), [1998No08](#), [2018No02](#)).

 ^{13}O Levels

E(level) [†]	J π [‡]
0	(3/2 ⁻)
2.82 $\times 10^3$ 24	

[†] From [1978Co15](#).

[‡] From [1980Ho20](#).