$^{17}O(\pi^+,\pi^{+\prime}),(\pi^-,\pi^{-\prime})$ 1984Bl17

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. G. Sheu, J. H. Kelley, J. Purcell	ENSDF	5-Aug-2021

1984Bl17: Differential cross sections for $\pi^{\pm}$ scattering were measured from E_π=164 MeV bombardment of a 75 mg/cm^2, cooled ^{17}O gas target (49.9% ^{17}O, 26.9% ^{16}O, 23.2% ^{18}O; 120° K temperature and 2 atm pressure) with the EPICS system/LAMPF. The energy resolution was ≈150 keV (FWHM) and the spectrometer′s angular acceptance was ≈3°. Spectra were taken between θ=18°−48°, 56°, 65°, and 74° in 6° steps covered a range of 30 MeV in excitation energy (pion energy loss). Angular distributions to ^{17}O states were analyzed by DWIA. Evidence was suggested for E2 strength near 8 MeV and for M4 strength to two states at E_x=15.7 and 17.1 MeV.
See also (1983BlZX).

Theory:
1975Pa06: $^{17}O(\pi,\pi)$; calculated hyperfine interaction.
1977Si01: $^{17}O(\pi,X)$, E≈190 MeV; calculated pion induced nucleon knockout σ.
1981Os04: $^{17}O(\pi^{\pm},\pi^0)$, E=130-250 MeV; calculated total σ(E), $\sigma(\theta)$; deduced importance of Δ-isobar property renormalizations. Glauber theory, shell model configurations, Woods-Saxon single particle functions.

^{17}O Levels

E(level)†	Jπ†	E(level)†	Jπ†	E(level)†	Jπ†	E(level)†	Jπ†
0.87×10^3	1/2$^+$	5.22×10^3	9/2$^-$	6.86×10^3	(7/2$^-$)	8.40×10^3	
3.05×10^3	1/2$^-$	5.38×10^3	3/2$^-$	7.58×10^3	7/2$^-$	15.7×10^3	13/2$^-$
3.85×10^3	5/2$^-$	5.69×10^3	7/2$^-$	7.76×10^3	11/2$^-$	17.1×10^3	11/2$^-$
4.55×10^3	3/2$^-$	5.73×10^3	(5/2$^-$)	8.09×10^3			

† From (1984Bl17).