

## ISOSPIN MIXING IN THE $1^+$ DOUBLET IN $^{12}\text{C}$

P.P. Singh, J. Comfort, W.W. Jacobs, R.E. Marrs, A. Nadasen, P. Pile, R. Pollock and M. Sadler

The inelastic deuteron scattering cross section at 76 MeV deuteron bombarding energy has been measured with 3-8 mg/cm<sup>2</sup> thick carbon targets over an excitation range of about 11.7 to 15.7 MeV. The scattered particles were detected using the QDDM spectrograph with an overall energy resolution of 60 keV. The explicit motivation was to find the cross section with which 15.11 MeV  $1^+$ , T=1 state is populated relative to that of the 12.71 MeV  $1^+$ , T=0 state and to compare this ratio with that reported for 29 MeV<sup>1,2</sup>). The angular distribution for the 12.7 MeV state has been measured from 6° to 44° (laboratory) in steps of 1° to 4°. In the vicinity of 15.11 MeV excitation there is a slight indication of a peak. Using the data obtained in two long runs, one at 24° and another at 32°, the ratio of the yield for the 15.11 state to yield for the 12.71 MeV state is found to be  $0.5\% \pm 0.3\%$  and  $0.3\% \pm 0.3\%$ , respectively. This ratio, which depends upon the isospin mix-up in the two members of the doublet, was found to be  $1.1\% \pm 0.05\%$  at lower energies. Though errors associated with the measured ratio at 76 MeV are relatively large, the mean of the two measurements  $0.4\% \pm 0.2\%$  is a factor of 2-3 smaller than that determined at 29 MeV.

Further measurements to improve the accuracy of these results are in progress.

- 1) W.J. Braithwaite, J.E. Bussolletti, F.E. Cecil and G.T. Garvey, Phys. Rev. Letts. 29, 376 (1972).
- 2) J.M. Lind, Ph.D. Thesis, Princeton University, 1976.

\*Present address: University of Pittsburgh, Physics Department, Pittsburgh, Pennsylvania 15260.