

- 2) R.N. Boyd, S.L. Blatt, T.R. Donoghue, H.J. Hausman,
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THE (d,⁶Li) REACTION STUDIES

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We are beginning a study of the (d,⁶Li) reaction with vector polarized deuterons at the IUCF. Several interesting features of the vector analyzing powers are predicted by DWBA reaction calculations. Firstly, the VAP is expected to exhibit much more sensitivity to the transferred angular momentum, L_{Tr} , than do the differential cross sections. Thus, it is hoped that the VAP will provide considerably more definitive spectroscopic information than can be obtained from the cross sections alone. Secondly, this sensitivity of the VAP to L_{Tr} should provide the possibility of accurate determinations of L_{Tr} -mixing in (d,⁶Li)

reactions on odd A targets. These features provide the motivation for the (\vec{d} ,⁶Li) studies on ³⁹K and ⁴⁰Ca.

In addition, the DWBA calculations suggest that the VAP is, for some nuclei, quite sensitive to the spin-orbit term of the ⁶Li distorting potential. While this is not the case for ³⁹K and ⁴⁰Ca targets, this sensitivity does appear for fp shell targets. We therefore plan to examine (\vec{d} ,⁶Li) data on Ni targets, both in the hope of producing some systematic data on alpha clustering states, and of determining the ⁶Li spin-orbit potential.

STUDY OF TWO-PROTON PICKUP USING THE (⁶Li,⁸B) REACTION

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A considerable body of experimental data has been obtained from reactions which transfer two identical nucleons - reactions such as (p,t), (t,p), and (³He,n).

Almost no data are available, however, from reactions which pickup two protons from a target. We have studied one such reaction, the (⁶Li,⁸B) two-proton pickup reaction, on nine even targets ranging from

⁵⁶Fe to ¹³⁰Te. Some of these results, principally on targets in the tin region, were presented in the 1978 IUCF Progress Report.¹

Using a ⁶Li bombarding energy of 90 MeV, we have measured lab cross sections at 8⁰ for ground-state transitions which have ranged from 27 $\mu\text{b/sr}$ for a ⁶⁶Zn target to 0.3 $\mu\text{b/sr}$ for ¹³⁰Te.