0.60, was measured in a helium polarimeter between the two cyclotrons. Reaction ^{6}Li particles were momentum analyzed using the QDDM magnetic spectrograph and detected using the helical wire counter and two plastic scintillators. In order to discriminate between reaction ^{6}Li particles and α-particles, the helix voltage was reduced about 300 V from its normal operating level, thus allowing the helix anode signal to be used as a ΔE signal.

A preliminary run was taken of the ^{24}Mg($\vec{d}$,^{6}Li)^{20}Ne reaction. Angular distributions were taken from 10° to 40° in 5° steps for the 0^+(g.s.), 2^+ (1.63 MeV) and 4^+(4.25 MeV) levels. The data are presently being analyzed, and will be compared to reaction calculations when the analysis is completed.

1) See, e.g., P. Martin, J.B. Viano, J.M. Loiseaux and V. LeChalony, Nucl. Phys. A212, 304 (1973); O. Hansen, J.V. Maher, J.C. Vermeulen, L.W. Put, R.H. Siemssen and A. Van der Woude, Nucl. Phys. A292, 253 (1977); F.L. Milder, J. Janecke and F.D. Becchetti, Nucl. Phys. A276, 72 (1977); F.D. Becchetti, et al., Phys. Rev. C19, 1775 (1979).

SOME ^{10}B+α REACTIONS AT 150 MeV

J.M. Lambert, P.A. Treado, R.O. Bondelid, M. ElHawamdah and B.J. Lambert
Georgetown University, Washington, D.C. 20057

I. Slaus
Georgetown University and Rudjer Boskovic Institute, Zagreb, Croatia, Yugoslavia 41001

D.W. Devins
Indiana University Cyclotron Facility, Bloomington, Indiana 47405

Both single telescope and coincident telescope data for the final state ^{6}Li and α particles from ^{10}B+α reactions with a thin ^{10}B target and the 150 MeV IUCF α beam have been obtained.

Preliminary analysis provides angular distributions for the ^{10}B(α,^{6}Li)^{8}Be* reactions which are similar to those previously published.[1] Figs. 1 and 2 show the distributions and predictions from the code DWUCK for the ground state and 2.9 MeV ^{8}Be state. Table 1 gives the DWUCK parameters used. All predictions are for L=2, J=3.

Breakup data for the ^{10}B+α to (^{6}Li,^{6}Li,d) and (^{6}Li,α,α) final states indicate that the quasifree processes do not dominate the breakup cross section and that phase space or simultaneous breakup processes contribute overwhelmingly to the (^{6}Li,α,α) final state cross section.

The ground state of ^{10}B, which is T=0, $J^\pi=3^+$, should have an appreciable component of the α+^{6}Li$_{2.18}$ cluster structure with orbital angular momentum L = 0,2,4.[2] The pole graph of Fig. 3 depicts the ^{10}B+α quasifree scattering processes in which the transferred particle (labelled ^{6}Li) can be either a ^{6}Li or a ^{6}Li$_{2.18}$. These two modes can be distinguished by measuring the L=0 and L=2 components of the Fourier transforms of the α-^{6}Li relative-motion wave function.

Table 1. ^{10}B(α,^{6}Li)^{8}Be DWUCK Parameters

	V	r	a	W	r_w	a_w	r_c
α	100	1.25	0.8	20	1.60	0.60	1.3
^{6}Li	40	1.48	0.5	5	1.86	0.86	1.3

(Potential strengths in MeV, geometry parameters in fm)

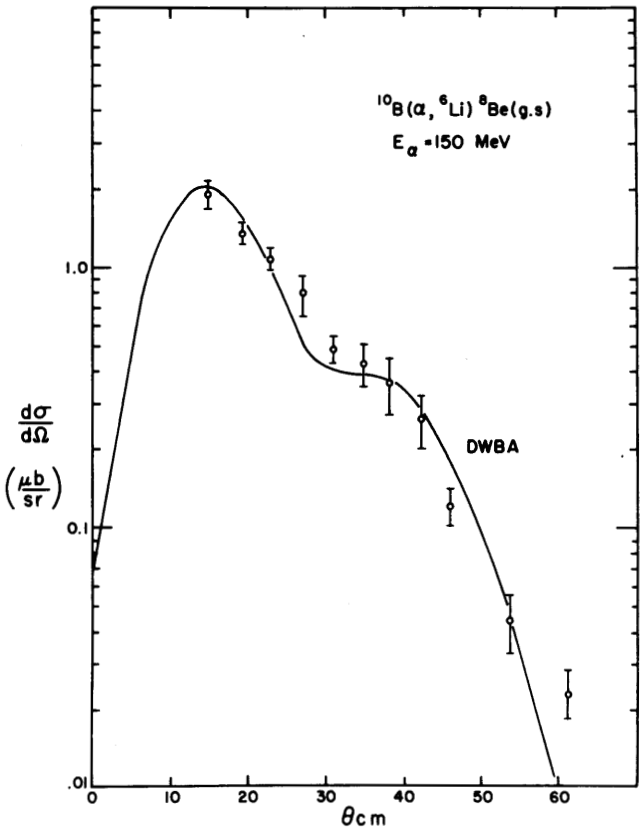

Figure 1. Angular distribution for the $^{10}B(\alpha,^{6}Li)^{8}Be$ reaction to the ground state. The shape of the predicted spectrum is not sensitive to V or W of ^{6}Li, but is quite sensitive to the V of the α-particle. The W of the ^{6}Li affects the magnitude of the cross section which has been arbitrarily normalized to the data.

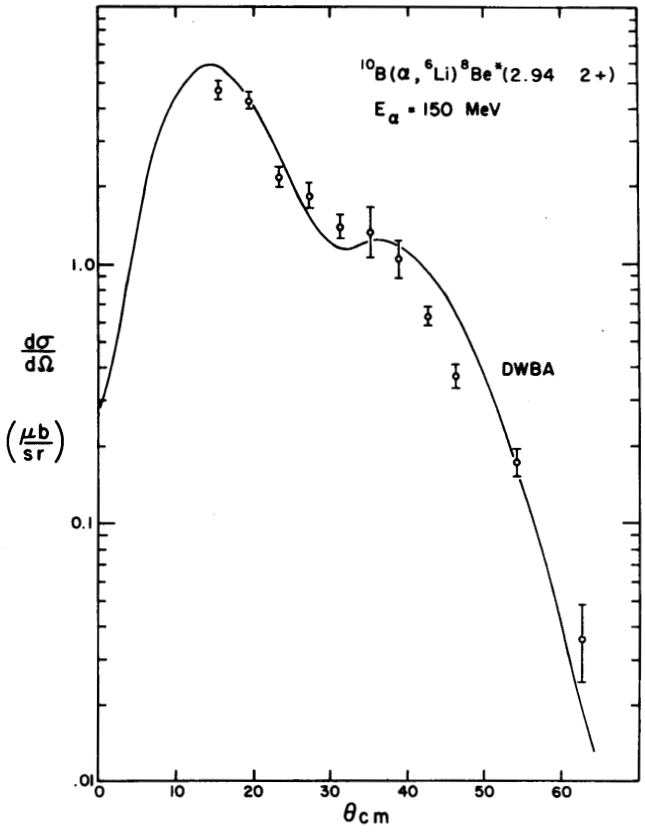

Figure 2. Same as Fig. 1., but for the $^{10}B(\alpha,^{6}Li)^{8}Be$ reaction to the 2.9 MeV state.

Any L=0 component should be due to $^{6}Li_{2.18}$ being the transferred particle. Fig. 4 shows part of the data and a PWIA relative cross section prediction. With the paucity of data, it is difficult to determine the L=0 contribution, but the data suggest that the process is dominated by the L=2 component and that some L=0 contribution will be required to fit the data.

1) B. Zeidman, et al., Phys. Rev. C2, 1612 (1970).

2) D. Kurath, Phys. Rev. C7, 1390 (1973), and reference therein.