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ANALYZING POWERS FOR THE ^{13}C AND $^{208}Pb(\vec{p},d)$ REACTIONS AT 123 MeV

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We have measured differential cross sections and analyzing powers for the first two levels in the $^{13}C(\vec{p},d)$ reaction and the first six levels in the $^{208}Pb(\vec{p},d)$ reaction at 123 MeV bombarding energy. The experimental method was the same as that described in the preceding report.[1] Several preliminary analyzing-power distributions for the $^{208}Pb(\vec{p},d)$ reaction appear in Figures 1 through 4.

The $^{13}C(\vec{p},d)^{12}C$ analyzing powers for the transitions to the 0^+ ground state ($p_{1/2}$ pickup) and the 4.44-MeV 2^+ level ($p_{3/2}$ pickup) are quite similar to those observed at 65 MeV[2] and 200 MeV.[3] The DWBA description of them is quite poor. The failure is comparable to that reported[4] for the $^{24}Mg(\vec{p},d)^{23}Mg$ (2.36-MeV $1/2^+$ level) at 95 MeV.[1]

In contrast to the $^{13}C(\vec{p},d)^{12}C$ data, the $^{208}Pb(\vec{p},d)$ analyzing powers show only slight $j>$ vs. $j<$ dependence based on comparisons of $p_{1/2}$ vs. $p_{3/2}$ and $f_{5/2}$ vs. $f_{7/2}$ angular distributions. All analyzing-power angular distributions show significant structure which becomes more pronounced for decreasing angular-momentum transfer.

Zero-range DWBA calculations were performed as described in Ref. 5 using optical potentials P7P and D3P of that reference. Some of these calculations appear as the solid curves of Figs. 1-4. Generally there is reasonably good agreement with the analyzing-power data in contrast with the very poor agreement observed for the lighter targets. Only for the 3.409-MeV $9/2^-$ level data shown in Fig. 4 is the agreement qualitatively poor.

Further analysis of these data is in progress.

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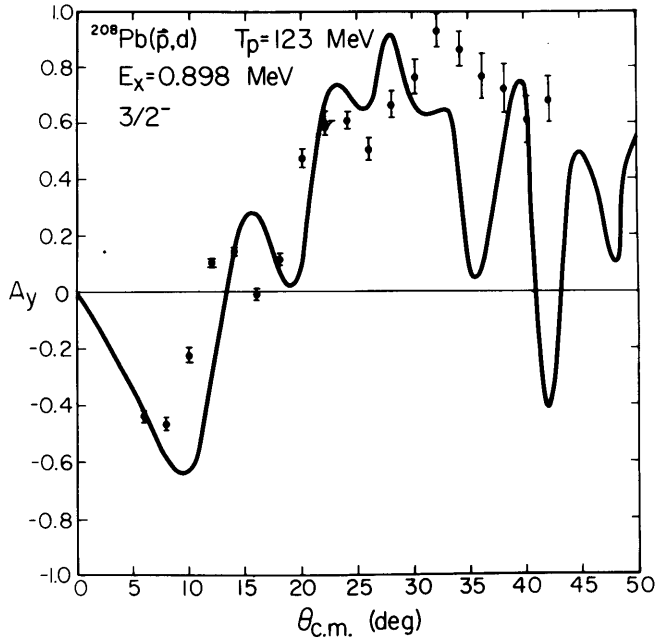

Figure 1. Analyzing power data for the ^{208}Pb(p,d) reaction at T_p = 123 MeV leading to the 0.898-MeV $3/2^-$ level compared with zero range DWBA calculations.

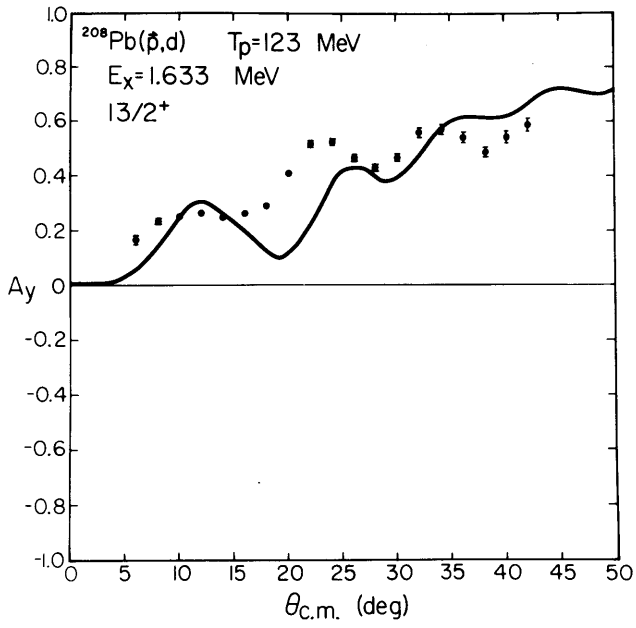

Figure 2. Analyzing power results compared with zero-range DWBA calculations for the 1.633-MeV $13/2^+$ state.

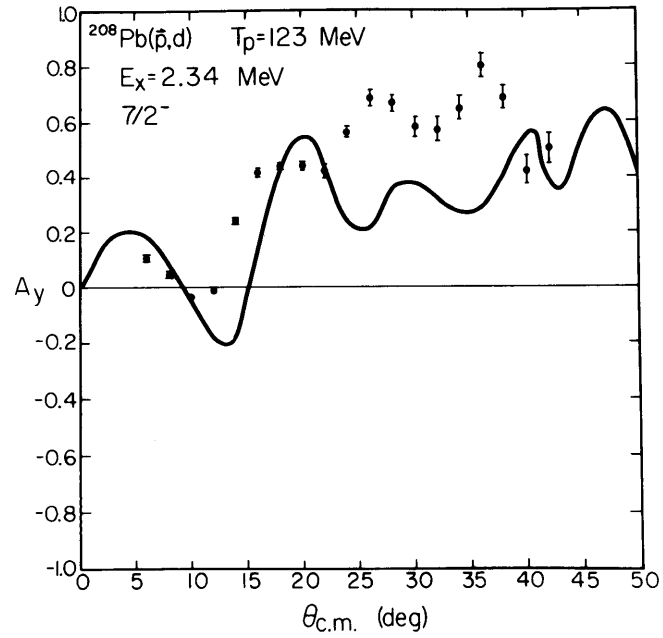

Figure 3. Analyzing power result compared with zero-range DWBA calculations for the 2.34-MeV state.

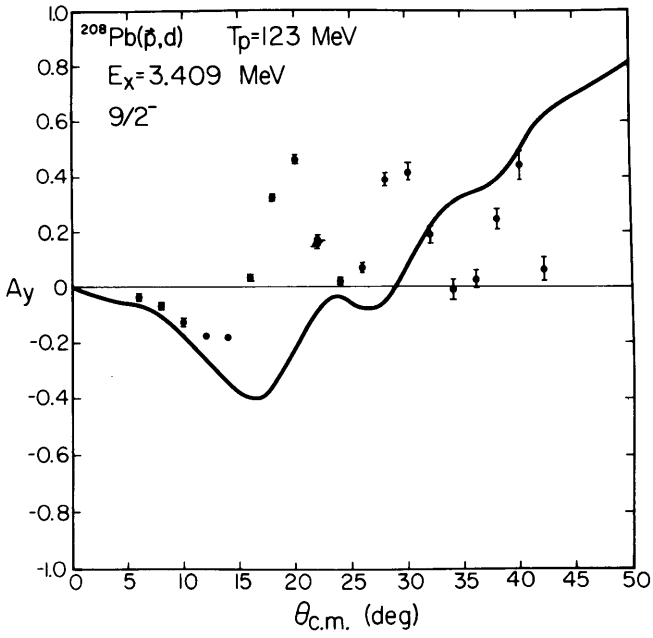

Figure 4. Analyzing power results compared with zero-range DWBA calculations for the 3.409-MeV $9/2^-$ state.