NEAR BARRIER FUSION OF ^{75}As + ^{46,50}Ti MEASURED BY THE GAS FILLED ENGE SPECTROGRAPH

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Sub-barrier fusion enhancement can be understood by a coupled-channel mechanism. For reactions with very proton rich nuclei, many transfer channels have large positive Q-values. With radioactive ion beams, many of these channels become energetically favorable, making the study of near-barrier fusion particularly interesting.

We have developed detectors and techniques for measuring fusion cross sections in inverse kinematics using the gas-filled Enge spectrograph with stable ion beams. The experiment performed with the ^{75}As beam is presented here. The detector system is described elsewhere in this report.

The experiment was carried out using beams provided by the tandem accelerator in the HRIBF. Beams of 220 to 300 MeV ^{75}As were incident on ^{46,50}Ti targets. A monitor mounted in the scattering chamber at 10° is used for absolute normalization. The evaporation residues (ERs) were collected by the focal plane detector in the gas-filled Enge spectrograph. Particle identification was achieved by measuring energy, position and time-of-flight. Figure 1 shows the angular distribution of 242 MeV ^{75}As + ^{50}Ti. The curve is the results of calculations using the fusion-evaporation code PACE. Excellent agreement between the data and calculations can be seen. Further data analysis in obtaining excitation functions is underway.

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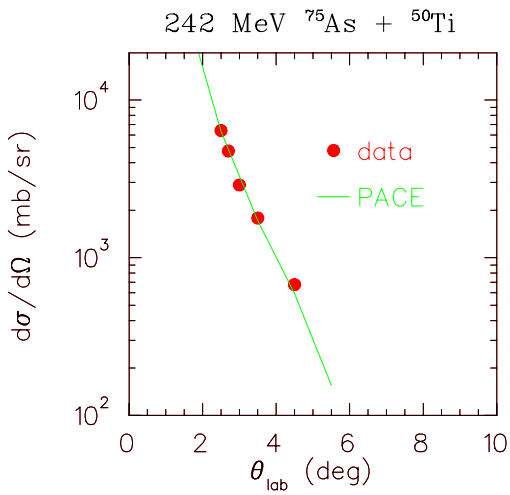

Figure 1: Angular distribution of 242 MeV ^{75}As+^{50}Ti. The data are shown by the solid circles and the PACE calculations are shown by the solid curve.