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The $6\text{He}+120\text{Sn}$ and $6\text{He}+58\text{Ni}$ scatterings

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Elastic angular distributions of the $6\text{He}+120\text{Sn}$ and $6\text{He}+58\text{Ni}$ scatterings have been measured at energies slightly above the Coulomb barrier. Three and four-body continuum discretized coupled channels calculations have been performed. For the $6\text{He}+58\text{Ni}$ system, the three-body CDCC calculation underestimates the experimental cross sections in the intermediate angles region and the four-body calculation reproduces very well the data in the whole angular range of the measurements. In these CDCC calculations we folded realistic optical potentials of the n +target and α +target sub-systems, to build the total 6He +target potential. No parameter adjustment has been performed and the results can be considered as predictions.

Total reaction cross-sections have been obtained from the CDCC results and are compared with the cross sections for several stable systems. The total reaction cross section of the exotic system 6He +target are systematically larger than the weakly bound stable systems, such as 6Li +target.

A large yield of alpha particles has been observed in the spectra of the $6\text{He}+120\text{Sn}$ collision, with velocities around the velocity of the projectile and, this alpha particle yield seems to account for the observed enhancement in the total reaction cross section.

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