OPTICAL AND COUPLED-CHANNELS DESCRIPTION OF ^{20}NE+^{16}O ELASTIC SCATTERING

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Abstract. The elastic scattering of the ^{20}Ne+^{16}O system has been analyzed with a phenomenological potential approach within the framework of the optical and coupled-channels models at E_{Lab}=50.0 MeV[1-15]. The striking feature of the experimental data is the oscillatory structure at the intermediate angles and a rapid increase at large angles. Optical potentials have difficulty in describing such structures and predict a fall of experimental data around the intermediate angles. In order to explain this structure, we have used a deep real potential with a sum of Woods-Saxon typed surface and volume imaginary potentials. We present that deep real potential with these imaginary potentials explain the oscillatory structure and backward rise observed in the elastic scattering data within both models. It should be pointed out that there is a magnitude problem of the inelastic 2^+ data for the deformed ^{20}Ne nucleus that the standard coupled-channels model is unable to predict correctly.

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