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ELASTIC AND INELASTIC SCATTERING OF ^{12}C IONS BY ^{7}Li AT 115 MeV

Angular distributions of the ^{7}Li + ^{12}C elastic and inelastic scattering as well as the ^{7}Li(^{14}N, X) reactions with exited stable and unstable nuclei with Z = 3-6 were measured at E_{lab}(^{12}C) = 115 MeV. The data were analyzed within the optical model and coupled-reaction-channels method. The elastic and inelastic scattering, reorientations of ^{7}Li in ground and excited states as well as more important transfer reactions were included in the channels-coupling-scheme. ^{7}Li + + ^{12}C optical potential parameters for ground and excited states of ^{7}Li and ^{12}C as well as deformation parameters of these nuclei were deduced. The contributions of one- and two-step transfers in the ^{7}Li + ^{12}C elastic and inelastic scattering channels were estimated.

Keywords: heavy-ion scattering, optical model, coupled-reaction-channels method, spectroscopic amplitudes, optical potentials, reaction mechanisms.