THE ^{7}Li(^{18}O, ^{17}O)^{8}Li REACTION AND THE ^{17}N + ^{8}Be-POTENTIAL

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The new data of the angular distributions of ^{7}Li(^{18}O, ^{16}N)^{9}Be reaction were obtained for the transitions to the ground and excited states of ^{8}Be and ^{17}N at the energy $E_{\text{lab}}(^{18}\text{O}) = 114$ MeV. The angular distributions of the reaction were measured for the first time. Data were analyzed with coupled-reaction-channels method for one- and two-step transfers of nucleons and clusters. In the analysis, the ^{7}Li + ^{18}O potential deduced in the analysis of the elastic ^{7}Li + ^{18}O-scattering data as well as shell-model spectroscopic amplitudes of transferred nucleons and clusters were used. The parameters of the ^{9}Be + ^{16}N potential were deduced using the reaction data. The contributions of different one- and two-step transfers in the ^{7}Li(^{18}O, ^{16}N)^{9}Be reaction cross-section was studied.

Keywords: nuclear reactions, optical model, coupled-reaction-channels method, folding-model, spectroscopic amplitudes, optical potentials, reaction mechanisms.