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

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Angular distributions of the ^{7}Li(^{18}O, ^{17}N)^{8}Be reaction were measured for the transitions to the ground states of ^{8}Be and ^{17}N and excited states of ^{17}N at the energy E_{lab}(^{18}O) = 114 MeV. The 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. Parameters of the ^{8}Be + ^{17}N potential were deduced using the reaction data. Contributions of different one- and two-step transfers in the ^{7}Li(^{18}O, ^{17}N)^{8}Be reaction cross-section was studied.

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