

THE ${}^7\text{Li}({}^{18}\text{O}, {}^{17}\text{O}){}^8\text{Li}$ REACTION AND THE ${}^{17}\text{O} + {}^8\text{Li}$ POTENTIAL

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The angular distributions of the ${}^7\text{Li}({}^{18}\text{O}, {}^{17}\text{O}){}^8\text{Li}$ reaction were measured for the transitions to the ground and excited states of ${}^8\text{Li}$ and ${}^{17}\text{O}$ at the energy $E_{\text{lab}}({}^{18}\text{O}) = 114$ MeV. The data were analyzed with coupled-reaction-channels method for one- and two-step transfers of nucleons and clusters. In the analysis, the ${}^7\text{Li} + {}^{18}\text{O}$ potential deduced in the analysis of the elastic ${}^7\text{Li} + {}^{18}\text{O}$ -scattering data as well as shell-model spectroscopic amplitudes of transferred nucleons and clusters were used. The reaction mechanism was studied. The parameters of the ${}^8\text{Li} + {}^{17}\text{O}$ potential were deduced and were compared with these of the ${}^7\text{Li} + {}^{18}\text{O}$ potential. The ${}^8\text{Li} + {}^{17}\text{O}$ folding-potential was calculated and compared with the deduced in the reaction data analysis.

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