Analysis of scattering and breakup reactions of ^{12,14}Be within the microscopic model of optical potential

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Analysis of the differential cross sections of scattering of neutron-rich nuclei $^{12;14}$Be on ^{12}C at 56 MeV/nucleon and on protons at energy near 700 MeV/nucleon is carried out within the microscopic model of optical potential (OP). The real part of the ^{12,14}Be+^{12}C OP is calculated by using the double-folding procedure accounting for the anti-symmetrization effects, while the imaginary part of OP is obtained in the framework of the high-energy approximation (HEA). As to the scattering of protons on ^{12,14}Be at relativistic energies, calculations of the both real and imaginary OPs were made within the HEA approach. In this framework, the only free parameters of OP are the depths of its real and imaginary parts obtained by fitting experimental data. The role of the ^{12}Be and ^{14}Be density models is considered when reproducing the experimental data. A contribution of the inelastic channels with excitations of 2^+ and 3^- states in ^{12}C in calculating the quasielastic cross sections is analysed. Also, the ^{14}Be cluster model, in which this nucleus consists of a 2n-halo and the ^{12}Be core, is applied to calculate the cross sections of diffraction breakup and stripping reactions in the ^{14}Be+^{12}C collisions at the energy of 56 MeV/nucleon. A good agreement of the theoretical results with the available experimental data of both scattering and breakup processes is obtained.