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α+^{15}O cluster structures in ^{19}Ne and the α resonant scattering REIJI OTANI, MASATAKA IWASAKI, MASASHI TOMITA, MAKOTO ITO, Department of pure and applied physics, Kansai university — Cluster structures are well known to appear in the excited states of light nuclear systems. A typical example is the α+^{16}O cluster structures in ^{20}Ne, and the α+^{15}N structures are also deeply analyzed in ^{19}F, which is one proton deficient system of ^{20}Ne. However, the α+^{15}O structure, corresponding to the neutron deficient system of ^{20}Ne, still remains unclear. In the present study, we investigate the α+^{15}O structure in ^{19}Ne by employing a simple potential model. We assume the Wood-Saxon potential for the nuclear potential of α+^{15}O, and its parameter set is fixed by solving the α+^{15}N elastic scattering. From the nuclear potential determined from the α+^{15}N scattering problem, we calculate the energy levels in the ^{19}Ne = α+^{15}O system by adding the Coulomb interaction to the α+^{15}N system. The absorbing boundary condition is imposed on the unbound states in α+^{15}O, and the resonant levels in ^{19}Ne are identified. We have also calculated the excitation function of the resonant α+^{15}O elastic scattering under the same condition as the recent experiments. In the present report, we will show our prediction of the α+^{15}O rotational bands and the cross sections in the resonant α scattering. Moreover, we will also report the application of the microscopic cluster model to the ^{19}Ne = α+^{15}O system.

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