ISOTOPIC EFFECTS IN ELASTIC AND INELASTIC $^{12,\,13}$C + $^{16,\,18}$O SCATTERING

A. T. Rudchik, Yu. O. Shyrma, E. I. Koshchy, S. Kliczewski, B. G. Novatsky, O. A. Ponkratenko, E. Piasecki, G. P. Romanyshyna, K. Rusek, Yu. M. Stepanenko, I. Strojek, S. B. Sakuta, A. Budzanowski, L. Głowacka, I. Skwirczyńska, R. Siudak, J. Choiński, A. Szczurek

New angular-distribution data of ^{13}C + ^{18}O elastic and inelastic scattering at the energy $E_{lab}(^{18}$O) = 105 MeV were obtained for the transitions to the ground and excited states 3.088 MeV($1/2^+$), 3.555 MeV ($1/2^-$), 3.854 MeV ($5/2^+$) of ^{13}C and 1.982 MeV (2^+), 3.555 MeV (4^+), 3.921 MeV (2^+), 4.456 MeV (1^-), 5.098 MeV (3^-), 5.260 MeV (2^+) of ^{18}O. These and the ^{13}C + ^{18}O elastic scattering data taken from the literature at the energies $E_{lab}(^{18}$O) = 15, 20, 24, 31 MeV and $E_{lab}(^{13}$C) = 24 MeV were analysed within the optical model and coupled-reaction-channels methods. Sets of ^{13}C + ^{18}O optical potential parameters and their energy dependence were obtained. Contributions of potential scattering and transfer reactions to the elastic and inelastic channels of ^{13}C + ^{18}O scattering were studied. Isotopic differences (effects) in $^{12,\,13}$C + $^{16,\,18}$O optical potential parameters were investigated.

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