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Effect of Woods-Saxon Potential on the $^{16}O+^{20}Ne$ Reaction Cross Section

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Abstract: The excitation function and angular distributions for the $^{16}O+^{20}Ne$ system have been explained using the distorted wave Born approximation (DWBA) calculations. The real and imaginary Woods-Saxon optical potentials are assumed to be energy-dependent. The gross resonant structures observed in the $^{20}Ne(^{16}O, ^{16}O)^{20}Ne$ excitation function are well described by the present DWBA calculations. Although the elastic and elastic-transfer analyses introduce a qualitative description of the experimental data, the coherent sum of the two reaction processes exhibit a much better result for both forward and large-angle data.

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Key words: $^{20}Ne(^{16}O, ^{20}Ne)^{16}O$, $^{20}Ne(^{16}O, ^{16}O)^{20}Ne$, incident energies=24.5 MeV, calculated $\sigma(\theta)$, DWBA calculations

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