An Investigation of He-4+C-12 and He-4+O-16 Reactions Using the Cluster Model

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Abstract

The alpha-target semimicroscopic single folding potentials have been derived by folding a composite (repulsive and attractive) effective alpha-alpha interaction with the alpha-cluster distribution density in the target nuclei. The obtained potentials are considered as the real part of the nuclear optical model potentials, while the imaginary parts are phenomenologicaly expressed using the Woods-Saxon form. Nine sets of measured experimental data of the He-4+C-12 and He-4+O-16 elastic rainbow scattering over the energy range 80-240 MeV are analyzed using the obtained potentials. The data are successfully reproduced using the extracted potentials. The resulted reaction cross sections are also investigated and compared with the available corresponding data.

Keywords

Author Keywords: optical model; elastic scattering; folding potential; cluster model

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