Optical model parameters of alpha induced reactions on Ar-36.

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Nucleosynthesis and energy production in stellar environments depend critically on nuclear reaction cross sections. Alpha-induced reactions, in particular, play an important role in the helium burning stage of stars, novae, and supernovae. As part of an international collaboration, funded in part by the Civilian Research & Development Foundation, experimental data on elastic and inelastic scattering on Ar-36 were fitted using several optical model parameters. These parameters were used as input data for calculation of the Ar-36(α, γ) and Ar-36(α, n) cross sections performed using the statistical model code EMPIRE-2 code in the energy region of interest for astrophysical applications. The evaluations are stored in the ENDF format and will be made available to the community.

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