

Backangle Anomaly In Scattering Of Alpha-Particles From Si-28 At Low Energies

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Summary

In order to resolve the differences in time literature on the existence of quasi-molecular states in the alpha-Si-28 system, excitation functions were measured for the scattering of alpha-particles from Si-28 in the incident energy range $E_{\text{lab}} = 3-7.8$ MeV. An angular distribution measurement was carried out in the angular range $\theta(\text{lab}) = 30$ degrees-174.5 degrees for every potential resonance observed in the excitation functions. Data was analysed using a Regge-pole formalism by coherently adding specific resonances to an underlying diffraction term calculated by a strong absorption model. Furthermore, the usual compound elastic contribution was incoherently added to the direct interaction part of the cross section. The 6.8 MeV resonance was confirmed with $J = 3$ and some evidence was observed for a $J = 1$ resonance around 6.0 MeV. (C) 2000 Elsevier Science B.V. All rights reserved.

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