

Use of a High Resolution ΔE -E Gas-Ionisation Detector for the $6\text{Li} + 10\text{B}$ System at ELAB = 20 MeV

Wednesday, September 27, 2023 4:45 PM (13 minutes)

Light heavy-ion scattering reactions at incident energies not far above the Coulomb barrier can yield useful information when investigating nuclear astrophysics problems. A 20 MeV 6Li beam provided at the EN Tandem Van de Graaff accelerator of iThemba LABS (Gauteng) was used for the measurement of $6\text{Li} + 10\text{B}$ nuclear scattering reactions. A ΔE -E gas ionisation detector, which operates on the principle of energy loss, provided excellent charged particle identification (charge and mass) was positioned at $\theta_{\text{Lab}} = 35^\circ$ with respect to the beam. The scattered ions are stopped in a solid-state silicon surface barrier detector after traversing the ΔE gas ionisation cavity of the detector, which uses iso-butane gas. The very good energy resolution of the ΔE -E detector leads to various ground and excited states identified for the different reaction channels. Identified states are discussed and compared with the states already found in the previous work related to this low-energy nuclear scattering reaction.

Abstract Category

Nuclear Physics

Primary author: Dr OGANNA JOHN, Samuel Odumu (Center for Applied Radiation Science and Technology (CARST), North-West University (NWU), Mafikeng Campus, South Africa.)

Co-authors: Prof. CARTER, JOHN (School of Physics, University of the Witwatersrand, Johannesburg 2050, South Africa); Prof. T. USMAN, IYABO (School of Physics, University of the Witwatersrand, Johannesburg 2050, South Africa)

Presenter: Dr OGANNA JOHN, Samuel Odumu (Center for Applied Radiation Science and Technology (CARST), North-West University (NWU), Mafikeng Campus, South Africa.)

Session Classification: Parallel Session 1

Track Classification: Physics Research