Contribution ID: **37** Type: **Poster Presentation**

Stopping Force Measurements of 12C, 28Si, and 59Co Ions in Platinum Foils using Time-of-Flight Spectrometry

The time-of-flight elastic recoil detection analysis (TOF-ERDA) method is an ion beam analysis technique that can analyse light elements in a sample with high depth resolution. This method uses simultaneous measurements of recoil ion energy and time of flight to determine ion mass. TOF is used to compute the energy of recoil ions, resulting in higher energy resolution than standard Silicon semiconductor detectors. In this paper, we provide a straightforward experimental approach for generating stopping force data of carbon, silicon, and cobalt ions through 78Pt throughout a continuous energy range of 0.05 MeV/u to 0.5 MeV/u. The measurement was performed utilizing a Time of Flight - Elastic Recoil Detection Analysis (ToF-ERDA) configuration. A 40 MeV 197Au9+ beam was used to recoil 12C, 28Si, and 59Co ions from thick carbon, silicon dioxide, and cobalt targets, respectively, into a platinum stopper foil. The energy loss of the incident recoils through the stopper foil was estimated using the measured ToF across a defined route length, both with and without the stopper foil, and the stopping force was computed using the measured foil thickness. The results were compared with semi-empirical. The findings were compared to semi-empirical calculations utilizing Ziegler's Stopping and Range of Ions in Matter (SRIM) and Sigmaud and Schinner's theoretical code, the PASS code. Our data in the energy range under consideration is in good agreement with SRIM-2013 and Arstila's work, within 0.1 - 0.38 MeV/u in 28Si-Mo ion-target, but DPASS reveals considerable variations.

Apply for student award at which level:

None

Consent on use of personal information: Abstract Submission

Yes, I ACCEPT

Primary author: MASENYA, Mamogo (iThemba LABS)

Co-authors: Mr BELALIA, Abderraouf (University of Blida, LPTHIRM Lab.); Prof. MSIMANGA, M (TUT/iThemba LABS)

Presenter: MASENYA, Mamogo (iThemba LABS)

Session Classification: Poster Session

Track Classification: Track A - Physics of Condensed Matter and Materials