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Energy loss and energy loss straggling of (MeV) heavy ions through thin film materials by Time of Flight spectrometry

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Abstract content
 (Max 300 words)

The accuracy of heavy ion beam analytical techniques such as Heavy Ion-Elastic Recoil Detection Analysis (HI-ERDA) depends on, among other factors, the accuracy of basic ion beam data such as stopping force and energy loss straggling, used as input in ion beam analysis codes. We present work done towards adding to the global database of experimental heavy ion stopping force and straggling data in compound materials of technological importance. Targets were in the form of free standing thin foils mounted on frames. The foils were characterised through RBS and AFM measurements to ascertain film thickness, stoichiometry and roughness. Energy loss and straggling measurements of $Z > 3$ ions were done in a transmission mode using the Heavy Ion ERD Time of Flight spectrometer at the iThemba LABS 6MV tandem accelerator. The stopping force and energy loss straggling of ^{12}C , ^{28}Si and ^{63}Cu ions through Si_3N_4 and SiO_2 foil targets were measured over the 0.1-0.8 MeV/u energy range, and these are compared to predictions from semi-empirical codes as well as to literature data, where available.

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