

Abstract

The energy-loss straggling of ^{28}Si , ^{27}Al , ^{24}Mg , ^{19}F , ^{16}O and ^{12}C partially stripped heavy ions has been determined in Formvar polymeric thin foil over a continuous range of energies 0.1–0.6 MeV/u, by using a powerful method based on the combination of Heavy Ion-Elastic Recoil Detection Analysis (HI-ERDA) technique and Time of Flight (ToF) spectrometer. The obtained energy loss straggling values have been analyzed and compared with the corresponding computed values adopting some widely used energy loss straggling formulations such as, Bohr, Bethe–Livingston and Yang formulas. The aim of such a comparison is to check the reliability and accuracy of the existing energy loss straggling formulations. The experimental results of energy loss straggling of all ions are found to be significantly greater than those predicted by the theories. These differences can be attributed to the charge exchange straggling. This effect has to be taken into account in order to explain the obtained results