

Measurement of 1-MeV C-ion beam induced X-ray production cross sections of Fe, Nb, Ru, Ce and Ta

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While the cross sections of heavy ion beams at energy of a few MeV and above have been measured and reported, experimental data, especially of those minor lines from uncommon materials, for lower-energy heavy ion beams around 1 MeV are lack. In this study, we used 1-MeV C-ion (83 keV/amu) PIXE (particle induced X-ray emission) to measure the X-ray production cross sections of Fe K-line, Nb, Ru and Ce L-line, and Ta M-line from thin films of the materials. The literature-reported experimentally measured Fe $K\alpha$ cross section for standard 2-MeV proton beam was used as a reference. The measured data were compared with those PWBA- and ECPSSR-theoretically calculated by program ISICS11 and found their deviations from the theoretical predictions in acceptable ranges.

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