P R E F A C E

Studies on the interaction of gamma radiation with matter are important both experimentally and theoretically. Out of the twelve possible types of interactions, the photoelectric process is one of the most important, dominating at low photon energies. An accurate knowledge of the photoelectric cross-sections is essential for the estimation of intensities of gammas and for the determination of the internal conversion coefficients. The latter studies are important for low-energy gamma transitions. Thus especially at low photon energies, a detailed investigation of the photoelectric cross-sections is very useful. With the availability of high-speed computers, very accurate theoretical estimates on the photoelectric cross-sections have become available. Although many experimental investigations have been made in the past most of these are based on the indirect method. Very few investigations are made employing the direct method. In addition, experimental data on the photoelectric effect are meagre in the rare earth region.

Thus, the present investigations are motivated by a desire to fill this gap in the experimental data present in the Z-region between 51 and 72. Thus, in the present study, nine elements in the rare earth region of the periodic table including Scandium and Ytterium have been selected and

measurements performed on a well-type plastic scintillation spectrometer to determine the total photoelectric cross-sections at five different photon energies in the range 84 to 661 KeV.