

Measurements of K Shell Absorption Parameters for Ce

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ABSTRACT

Mass absorption coefficients, attenuation cross sections and photoelectric cross sections around the K edge, K shell absorption jump ratios, absorption jump factors and oscillator strengths for Ce have been experimentally determined using the X-ray attenuation technique. In the measurements, some elements in the atomic range $49 \leq Z \leq 68$ have been excited using photons of 59,54 keV emitted from Am-241 annular source. The characteristic K X rays emitted from the elements counted with a Si(Li) detector having 4 mm active area and full width at half maximum (FWHM) of 160 eV at 5,9 keV. The experimental values were compared with the theoretically calculated values and other experimental and theoretical values in the literature. K shell absorption jump ratio, absorption jump factor and oscillator strength have been decreased with the increasing atomic number.

Ce has been excited with photons of 59,54 keV emitted from Am-241 radioactive annular source using EDXRF technique and their K shell fluorescence yield and $I_{K\beta}/I_{K\alpha}$ intensity ratio of this element has been analyzed by means of K X-ray peaks using a good geometry set-up. In order to obtain K shell fluorescence yield, K shell fluorescence cross-section ($\sigma_{K\alpha}$, $\sigma_{K\beta}$ and $\sigma_{K\text{toplam}}$) have been obtained. K_{α} ve K_{β} excitation factors have been experimentally determined from K shell fluorescence yield, $I_{K\beta}/I_{K\alpha}$ intensity ratio and K shell absorption jump factor have been experimentally determined using the X-ray attenuation technique from the first part of the study. The experimental values were compared with the theoretically calculated values and other experimental and theoretical values in the literature and it has been observed that the results are in good agreement with those in literature. K shell fluorescence cross sections, fluorescence yield, $I_{K\beta}/I_{K\alpha}$ intensity ratio and K_{α} ve K_{β} excitation factors have been increased with the increasing atomic number.