K-SHELL X-RAY FLUORESCENCE CROSS-SECTIONS, INTENSITY RATIOS AND K-L VACANCY TRANSFER PROBABILITIES FOR SOME PURE METALS OF MEDIUM ATOMIC NUMBERS USING 59.5 KEV PHOTONS

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K-Shell X-ray fluorescence cross-sections for some pure metals such as Cr, Fe, Co, Cu, Zn, Ga, Se, Y, Mo, Cd, In, Sn, Te, Ba have been theoretically and experimentally determined. The targets were irradiated with γ-photons at 59.5 keV from 50 mCi 241Am radioactive source. The characteristic K X-rays emitted by samples were detected using a super Si(Li) detector having a resolution of 150 eV at 5.9 keV. The IKβ/IKα intensity ratios for these metals were studied. In addition, the probabilities for vacancy transfer from K to L shell (η KL) for some pure metals of medium atomic numbers were obtained by measuring the IKβ/IKα intensity ratios. The obtained experimental values of the K-shell X-ray fluorescence cross-sections, the IKβ/IKα intensity ratios and the probabilities for vacancy transfer from K to L shell (η KL) have been compared with theoretical values. It was found that the theoretical calculations were consistent with the measured data in experimental error.

L X-RAY RELATIVE INTENSITY RATIOS OF URANIUM, LEAD, HAFNIUM AND SAMARIUM

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In this study the L shell x-ray relative intensities ($I_{Ll}/I_{L\gamma}$, $I_{L\alpha}/I_{L\gamma}$ and $I_{L\beta}/I_{L\gamma}$) for uranium (92U), lead (82Pb), hafnium (72Hf) and samarium (62Sm) have been measured for several scattering angles (85°, 95°, 105°, 115°, 125° and 135°) at 59.54 keV photon energy by using a Si(Li) detector which has a resolution of 160 eV at 5.9 keV. It was observed that the atomic number and angular dependence of L x-ray relative intensities did not change much, even though the atomic numbers of the samples were increased by a factor of ten.