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K-shell X-ray fluorescence cross-sections and intensity ratios for some pure metals at 59.5 and 123.6 keV

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Abstract

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, Ta, W and Bi have been theoretically and experimentally determined. The Cr, Fe, Co, Cu, Zn, Ga, Se, Y, Mo, Cd, In, Sn, Te and Ba metals were excited by 59.5 keV γ -ray from 50 mCi ²⁴¹Am radioactive source and the Ta, W and Bi targets were excited by 123.6 keV γ -ray from 25 mCi ⁵⁷Co radioactive source. The characteristic K X-rays emitted by samples were detected by using a super Si(Li) detector having a resolution of 150 eV at 5.9 keV. In addition, the $I_{K\beta}/I_{K\alpha}$ intensity ratios for these metals were studied. The obtained experimental values of the K-shell X-ray fluorescence cross-sections and the $I_{K\beta}/I_{K\alpha}$ intensity ratios have been compared with theoretical values. The measured values were in good agreement with theoretical values.

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