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Measurement of Rayleigh Scattering Cross-Section of $_{60}$Nd K X-Rays Elements with 26 ≤ Z≤ 90

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Abstract : Rayleigh scattering differential cross sections have been measured for the 36.84 keV (60Nd Kα2), 37.36 keV (60Nd Kα1) and 42.27 keV (60Nd Kβ1,3) X-rays. These measurements have been done in 44 elements with 22 ≤ Z ≤ 90 at an angle of 1390. The measurements are performed by using a radiation source consisting of an annular 60Nd foil excited by the 59.54 KeV γ-ray photons from 241Am radioactive source. The Nd Kα2, Kβ1,3 X-ray photons from the 60Nd annular foil (secondary photon source) are made to scatter from the target and the scattered photons are detected using Canberra made low energy Germanium (LEGe) detector. The measured Rayleigh scattering cross sections are compared with the theoretical MF, MFASF and the SM values. The noticeable deviations are observed from the MF, MFASF and SM values for 36.84 keV (60Nd Kα2), 37.36 keV (60Nd Kα1) and 42.27 keV (60Nd Kβ1,3) X-rays.

Keywords : Photon-electron interaction, Rayleigh scattering, X-ray fluorescence, X-ray
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