

Mass attenuation coefficients, effective atomic and electron numbers of stainless steel and carbon steels with different energies

ABSTRACT

The total mass attenuation coefficients ($\mu/$) of stainless steel (SS316L) and carbon steel (A516) that are widely used as petrochemical plant components, such as distillation column, heat exchanger, boiler and storage tank were measured at 662, 1073 and 1332 keV of photon energies. Measurements of radiation intensity for various thicknesses of steel were made by using transmission method. The γ -ray intensity were counted by using a Gamma spectrometer that contains a Hyper-pure Germanium (HPGe) detector connected with Multi Channel Analyzer (MCA). The effective numbers of atomic (Z_{eff}) and electron (N_{eff}) obtained experimentally were compared by those obtained through theoretical calculation. Both experimental and calculated values of Z_{eff} and N_{eff} were in good agreement.

Keyword: Mass attenuation coefficients ($\mu/$); Effective atomic number (Z_{eff}); Effective electron number; Hyper-pure Germanium (HPGe) detector; Multi Channel Analyzer (MCA)