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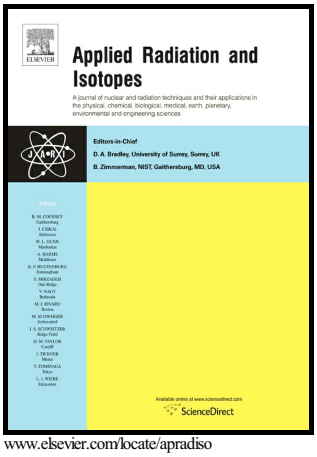

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Comparison of simulated and experimental values of self-absorption correction factors for a fast and credible adjust in efficiency curve of gamma spectroscopy

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Abstract:
Self-absorption correction factors are fundamental in spectroscopy to correct the efficiency of the samples detection whose density is different from the radioactive standard. Mathematical simulations have been widespread as a tool to facilitate the procedure of correction factors calculation. In this paper, LabSOCS was used to calculate the self-absorption correction factor for some geometries and the values found were compared to those obtained in MCNP and experimental values. The percentage deviations found for the self-absorption correction factor calculated by LabSOCS were below 1.6% when compared to experimental values. Deviations were below 1.9% in the curve extrapolation of the experimental procedure found in literature. Results obtained show that the deviations increase proportionally to the difference between the density values of the radioactive standard and the sample. High percentage deviations were also noticed in simulations whose samples had high densities, complex geometries and low energy gamma-rays.

Keywords:
Gamma spectroscopy; Self-absorption; MCNPX; LabSOCS