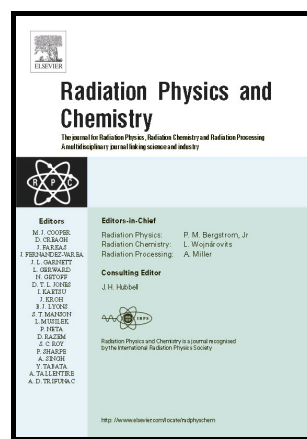


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Investigation of ionizing radiation shielding effectiveness of decorative building materials used in Bangladeshi dwellings

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Highlights

Studies of decorative building materials for shielding of ionizing radiation

High energy photon beam were used to obtain various interaction properties

Marble stone ‘Carrara’ from Italy shows suitability to be used as shielding material

Abstract

Following the rapid growing per capita income, a major portion of Bangladeshi dwellers is upgrading their non-brick houses by rod-cement-concrete materials and simultaneously curious to decorate the houses using luxurious marble stones. Present study was undertaken to investigate the gamma-ray attenuation co-efficient of decorative marble materials leading to their suitability as shielding of ionizing radiation. A number of commercial grades decorative marble stones were collected from home and abroad following their large-scale uses. A well-shielded HPGe γ -ray spectrometer combined with associated electronics was used to evaluate the mass attenuation coefficients of the studied materials for high energy photons. Some allied parameters such as half-value layer and radiation protection efficacy of the investigated marbles were calculated. The results showed that among the studied samples, the marble ‘Carrara’ imported from Italy is suitable to be used as radiation shielding material.

Keywords: Marble stones, HPGe γ -ray spectrometer, Mass attenuation coefficient, Shielding materials.

Introduction

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