2nd National Conference on Radiation Physics

15th – 16th December 2022

Book of Abstracts

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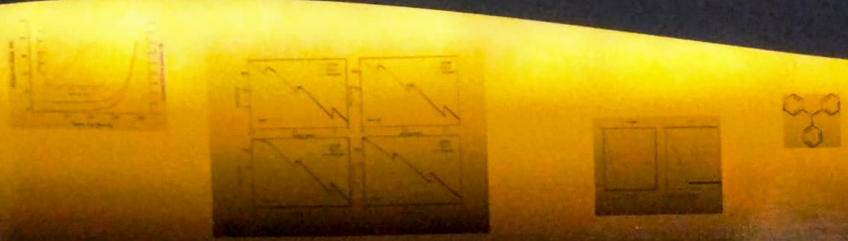

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Shielding characteristics of building material with ceramics of varying concentration at 661.6 keV gamma ray energy

C. Ashwitha[1] , G. P. Vatsala[1], B. Shilpa1, S. Sinchana[1], B. M. Sankarshan[2] , S. Krishnaveni[1]*
[1]*Department of Studies in Physics, University of Mysore, Manasagangothri, Mysuru - 570 006*
[2]*Department of Physics, The National Institute of Engineering, Mysuru - 570 008*
** corresponding author Email: sk@physics.uni-mysore.ac.in*

Abstract

In addition to lead shielding, concrete is one of the main shielding material used in the radiation environments such as nuclear reactor and nuclear Physics labs where high activity sources are involved. Generally for concrete mixture cement, sand and stone are mainly used. With this composition, the thickness needed would be large, making the construction costlier in terms of materials as well as labour. The chemical composition can be changed by adding varieties of fillers which would help reducing the thickness of the shielding and make it cost effective. Therefore, in the present work, we have prepared concrete mixture with ceramics as a filler in different concentration along with M sand and Cement. The mass attenuation coefficients of the prepared samples were measured for different concentrations of ceramics such as, 0%, 15%, 30% and 45% using gamma ray spectrometer with NaI(Tl) detector at the 661.6 keV gamma rays emitted by ^{137}Cs source. From the experiment it is found that obtained mass attenuation coefficients are 0.051, 0.075, 0.079 and 0.080 g cm^{-2} for cement with 0%, 15%, 30% and 45% ceramic concentration respectively. Also it is observed that mass attenuation coefficients increases with increase in the ceramic concentration. Thus the concrete with 45% ceramic composite can act as a good shielding material than concrete without filler.

Keywords: Concrete, Ceramic, Shielding, Filler, Mass attenuation coefficient

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Shielding Characteristics of building material with ceramics of varying concentration at 661.6 kev gamma ray energy.

in the **2nd National Conference on Radiation Physics (NCRP – 2022)** held at Bangalore University, Bengaluru during 15th -16th December 2022.

Dr. N. Nagaiah
Convener – NCRP 2022

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