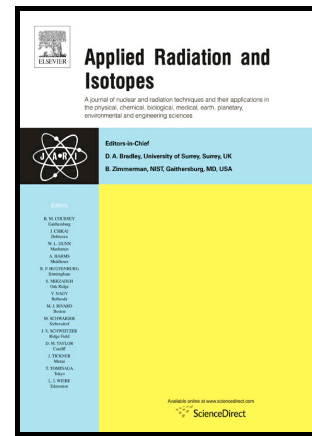


# Author's Accepted Manuscript

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PII: S0969-8043(16)30424-9  
DOI: <http://dx.doi.org/10.1016/j.apradiso.2017.03.029>  
Reference: ARI7862

To appear in: *Applied Radiation and Isotopes*

Received date: 11 July 2016  
Revised date: 28 March 2017  
Accepted date: 31 March 2017

Cite this article as: Santhosh M. Malkapur, L Divakar, Mattur C. Narasimhan, Narayana B. Karkera, P. Goverdhan, V. Sathian and N.K. Prasad, Neutron Radiation Shielding Properties of Polymer Incorporated Self Compacting Concrete Mixes, *Applied Radiation and Isotopes* <http://dx.doi.org/10.1016/j.apradiso.2017.03.029>

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## NEUTRON RADIATION SHIELDING PROPERTIES OF POLYMER INCORPORATED SELF COMPACTING CONCRETE MIXES

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### ABSTRACT

In this work, the neutron radiation shielding characteristics of a class of novel **polymer-incorporated self-compacting concrete (PISCC) mixes** are evaluated. Pulverized high density polyethylene (HDPE) material was used, at three different reference volumes, as a partial replacement to river sand in conventional concrete mixes. By such partial replacement of sand with polymer, additional hydrogen contents are incorporated in these concrete mixes and their effect on the neutron radiation shielding properties are studied. It has been observed from the initial set of experiments that there is a definite trend of reductions in the neutron flux and dose transmission factor values in these PISCC mixes vis-à-vis ordinary concrete mix. Also, the fact that quite similar enhanced shielding results are recorded even when reprocessed HDPE material is used in lieu of the virgin HDPE attracts further attention.

*Keywords: concrete mix, polymer incorporation, flux transmission, dose transmission, neutron radiation, hydrogen loading.*

### 1.0 INTRODUCTION

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