

# Preliminary Study of Radiation Doses from Some Natural Materials Used by the Construction Industry in Colombia

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## Abstract

The subject of radiation doses to the general public as a result of exposition to natural materials is comparatively recent, and, as in most developing countries, has not received much attention in Colombia. The Department of Physics at National University in Bogotá is just starting a master's program in medical physics and wishes to establish some lines of research in radiation related subjects. In this context we want to start a project in environmental radiation, including, but not limited to, radon and radiation associated with materials of construction.

This paper describes a preliminary study of samples of sand, Portland cement and bricks used in the construction industry in Colombia. The activity of  $^{40}\text{K}$ ,  $^{226}\text{Ra}$  and  $^{232}\text{Th}$  was determined, using a high-purity germanium detector, which was calibrated using the energy peaks of a punctual Eu-152 source.

The samples were milled, screened and sealed in 640 cm<sup>3</sup> glass containers for at least 30 days to attain radioactive equilibrium. The activity of the non-punctual samples was determined by a semi-empirical method based on the method developed by Helmer (1983). From the activity in the construction materials the radium equivalent activity ( $Ra_{eq}$ ) and annual dose rates will be evaluated and compared to the values obtained in other countries, as Egypt, Italy and Brazil.

**KEYWORDS:** *Exposition from natural radioactive sources, Radioactivity in construction materials, Estimates of dose-rates inside Colombian housing.*

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