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NATURAL RADIOACTIVITY OF SAND SAMPLES FROM TRANSYLVANIA AREA AND ASSESSMENT OF THE ENVIRONMENTAL RISKS ON CIVIL AND LIVESTOCK HOUSING

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Abstract

The present paper focuses upon the analysis of ²²⁶Ra, ²³²Th and ⁴⁰K radionuclides, making use of high-resolution HPGe γ -spectrometry devices. By means of this technique, the radiological risk is investigated in the case of various sand samples. The natural concentrations for ²²⁶Ra, ²³²Th and ⁴⁰K, from sand samples, ranged from (9.3-20.0 Bqkg⁻¹), (9.1-23.7 Bqkg⁻¹) and (203.5-403.3 Bqkg⁻¹), respectively. The radium equivalent activity of sands under investigation was also analyzed and ranged from 45 to 83 Bqkg⁻¹. The radiation hazard due to the use of sand as a building material on civil and livestock buildings was also estimated by a set of hazard indices such as H_{ext} and I_{pr} , respectively. The geological structure of the sand collection areas is discussed, too. The results of the research show that the samples under analysis are defined by a low natural radioactivity, meaning that they can be used as building materials (mortars, concretes) components, in civil and livestock construction, without enhancing their natural radioactivity.

Key words: environmental radioactivity, γ -spectrometry, hazard indices, sand

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