

Heat and Radiation Influence on Granite-Galena Concrete for Nuclear Shielding Applications

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Abstract : Advances in concrete technology and implementation of new materials made it possible to produce special types of concrete for different structural applications. In this research, granite and galena were incorporated in different concrete mixes to obtain high performance concrete for shielding against gamma radiations in nuclear facilities. Chemically prepared industrial galena was used to replace different volume fractions of the fine aggregate. The test specimens were exposed to different conditions of heating cycles and irradiation. The exposed specimens and counterpart unexposed specimens were tested to evaluate the density, the compressive strength and the attenuation coefficient. The proposed mixes incorporating galena showed better performance in terms of compressive strength and gamma attenuation capacity, especially after the exposure to different heating cycles.

Keywords : concrete, galena, shielding, attenuation, radiation

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