

ENHANCED SHIELDING AND MECHANICAL PROPERTIES OF WHITE CEMENT MORTARS VIA CELESTOBARITE FINE AGGREGATE

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ABSTRACT

This study emphasizes using barite mine wastes as aggregate material in blended mortar as an improved gamma-ray shielding structure in nuclear applications. Mortar mixtures made of white cement were prepared with various percentages of waste ranging from 0-30% as partial replacement of sand. Evaluation of density, flexural and compressive strength, and gamma-ray shielding were conducted. The increase in the percent of the barite wastes aggregates affects the gamma-ray attenuation coefficients. The results testified that the mine waste is appropriate as partial substitute to enhance gamma-ray shielding, ensures sustainability of natural resources and reduces the mortar and concrete costs.

KEYWORDS: *Celestobarite Mine Wastes, Fine Aggregate, Gamma-Ray Attenuation, Mortar, Mechanical Strength, Radiation Shielding*

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