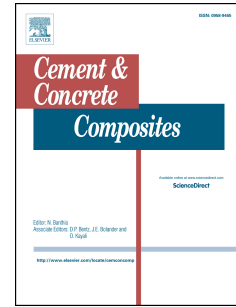


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# Evaluation of physical and mechanical characteristics of siderite concrete to be used as heavy-weight concrete

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## Abstract

The objective of this study is to investigate the usability of siderite aggregates mentioned above as a heavy-weight aggregate in the heavy-weight concrete production and their effects on physical properties of the heavy-weight concrete mixture. For this purpose, normal-weight aggregate content was decreased at the rate of 20%, 40%, 60%, 80% and 100% by volume of the concrete mixture prepared and mixtures were prepared by its substitution with siderite aggregate at the same rates. Based on the increase in siderite aggregate in the concrete mixture, a considerable increase in unit weight, compressive strength and tensile strength of concrete was obtained. Plate-shaped concrete specimens obtained from combined normal-weight and heavy-weight aggregates were exposed to radiation with different X-ray source (118 keV, 164 keV) and Co-60 (1250 keV) beam source at Çekmece Nuclear Facility. It is clearly seen that the concrete mixture containing siderite aggregate improved 70% radiation absorption characteristics compared to that of the concrete mixture without siderite aggregate.

**Keywords:** Siderite; heavy-weight concrete; radiation shielding.

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