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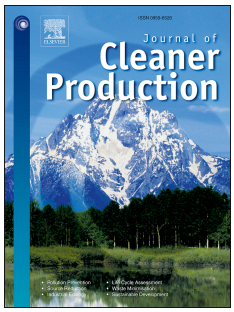

Phase characterizations, physical properties and strength of environment-friendly cold-bonded fly ash lightweight aggregates

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Phase characterizations, physical properties and strength of environment-friendly cold-bonded fly ash lightweight aggregates

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Abstract

Natural aggregates are non-renewable resources used in excess of 40,000 Mt annually to produce concrete. Artificial aggregates from industrial by-products can be produced as environmentally friendly alternatives. The cold bonding method to produce aggregates uses much less energy compared to the sintering method. This paper reports the results of an experimental investigation on phase characterizations, physical properties and strength of environment-friendly cold-bonded fly ash lightweight aggregates. High calcium fly ash was used as the lightweight material, whereas Portland cement or calcium hydroxide was added as the binder with a small amount in the range of 5–15% by weight to produce lightweight aggregates. Increased density and enhanced crushing strength with low water absorption were found in the fly ash aggregates with the addition of Portland cement or calcium hydroxide. This is due to the occurrence of both hydration and pozzolanic reaction when compared with

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