

Influence of Fly Ash upon Portland Cement Clinker Properties

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ABSTRACT

In Serbia thermal power plans generate about 6 to 7 Mt of fly ash per year. Large amount of produced fly ash is disposed on locations close to power plants and cover approximately 1800 hectares of arable land. Only small part is utilized, mostly by cement and concrete industry where fly ash is used as puzzolanic additive. Scope of this research work was to investigate influence of fly ash as a raw material for cement clinker synthesis, upon Portland cement clinker properties.

Fly ashes used were from four different power plants in Serbia. This investigation included characterization of the starting materials, raw mixture composition and characterization and synthesis and characterization of Portland cement clinker. The raw mixture composition was performed by substitution of traditional Portland cement clinker raw materials (marl, clay, quartz sand) with fly ash. The raw mixtures were prepared of lime and fly ash only, where contents of fly ash were about 20%. Synthesis of Portland cement clinker was carried out by sintering of the raw mixtures at two different temperatures. Chemical and mineral composition of the obtained Portland cement clinkers was determined and compared to ordinary commercial Portland cement clinkers. Based on this investigation, possible applications of the obtained Portland cement clinkers were suggested.

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