Activation of Reactivity of Fly Ashes

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KEYWORDS: Activation, blended cement, coal fly ash, strength, $CaCl_2$, Na_2SO_4

ABSTRACT

Nearly 60% of the electricity in the USA is produced by coal-fired plants, which results in the production of a large quantity of coal combustion residues, among which coal fly ash is the major component. Many applications have been developed for coal fly ash. The use of coal fly ash as a cement replacement in concrete is the most attractive one because of its high volume utilization and widespread construction. However, the replacement of cement with coal fly ash in concrete usually increases the setting time and decreases the early strength of concrete, but also has many advantages including better workability, higher long-term strength and improved durability of the concrete. This paper reviews different techniques, such as grinding, elevated temperature curing and use of chemical activators, for activating potential pozzolanic reactivity of coal fly ashes to overcome those disadvantages. A comparison indicates that the use of chemical activator is the most effective and efficient technique to activate the potential pozzolanic reactivity of coal fly ashes and to improve the properties of the fly ash concrete.