

Chemical Activation of Low Calcium Fly Ash: Part I: Identification of Most Appropriate Activators and Their Dosage

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ABSTRACT

Low calcium fly ash as a cementitious material has an inherent drawback - its relatively low reactivity. Thus an external agent is required to accelerate the hydration reactions. Thus an external agent is required to accelerate the hydration reactions. This study describes a novel way of preparing highly active fly ash suspension using a number of chemical activators. The main chemical activators investigated included: hydroxides of calcium and sodium in various concentrations, sodium carbonate, sodium sulfate, sodium chloride, nitrates of sodium, ammonium and calcium and binary mixtures of some of these compounds. These formulations have been used with both coarse and fine varieties of fly ash to determine the combined effect of mechanical and chemical activation. The study reveals that among the various chemical components used for chemical activation, sodium hydroxide in low concentration produces better performance and activation effect can be enhanced if mechanical activation is combined with chemical activation.