

Manufacture of Cementitious Materials with Coal Combustion Bottom Ash and FGD gypsum

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ABSTRACT

In this study, the manufacture of cementitious materials, such like calcium silicate phases and calcium aluminate phases, made from coal combustion bottom ash and FGD gypsum which are by-products generated from Coal Power Plant, has been carried out. From the study, it was known that the increase in the formation of calcium aluminate phases increases as the mixing ratio of FGD to the bottom ash, and tetracalcium trialuminosulfate($4\text{CaO}\cdot 3\text{Al}_2\text{O}_3\cdot \text{SO}_3$) and tricalcium aluminate ($3\text{CaO}\cdot \text{Al}_2\text{O}_3$) were formed from sintering at 1200 to 1350 as main calcium aluminate phases, together with calcium silicate($\text{CaOAl}_2\text{O}_3\text{SiO}_2$). These cementitious phases were melted at 1400°C of sintering temperature. The formation temperatures of those cementitious phases were relatively lower than that of theoretical formation temperature for them. The decreases of those formation temperatures are considered due to alkaline and iron component in bottom ash.

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