

Influence of Alkali-Silica Reaction on Delayed Ettringite Formation in Concrete

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Using mortars test piece comprising ASR reactive aggregates with added potassium sulfate, the effects of alkali-silica reaction (ASR) on delayed ettringite formation (DEF) were investigated under various environmental conditions. It is observed that ASR promotes the expansion caused by DEF, and such an expansion occurs prematurely, even under conditions wherein the amount of sulfate and the water supply are not significantly high. The increased DEF expansion could be attributed to the microcracks accompanying the progress of ASR at high temperatures, and the decrease in the cured product's pH owing to the consumption of an alkaline component during ASR. However, the final expansion caused by DEF tends to be less in mortars where ASR has occurred.