عنوان مقاله:

Effect of Drying and Wetting Cycles on Durability of Concrete Containing Slag and Limestone Powder under Magnesium Sulfate Ions

محل انتشار:

دومین کنفرانس بین المللی بتن و توسعه (سال: 1384)

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نویسندگان:

(D. Mostofinejad - *Associate Professor, Civil Engineering Department, Isfahan University of Technology (IUT*

(H. H. Nazari Monfared - *Former Graduate Student, Isfahan University of Technology (IUT*

خلاصه مقاله:

Persian Gulf has been known as one of the most aggressive environments for concrete structures. Chemical agents in sea-water play a very destructive role in deterioration of RC structures; however the role of some physical factors like wetting and drying cycles in destruction of concrete structures adjacent to sea-water could not be neglected. The concrete located in splash zone of sea-water is susceptible to be destroyed more severely due to different thermal coefficient of concrete ingredients in wet and dry modes, also due to leakage of calcium hydroxide from the concrete in successive wetting and drying condition. In the current study, the destructive influence of wetting and drying cycles on concrete durability under magnesium ion was investigated. To do so, 324 concrete specimens (70×70×70 mm) with 3 different water-to-cementitious material ratios (W/C=0.3, 0.4, 0.5), with 0%, %10 and %20 slag, and with 0%, 15% and 30% limestone powder, were cast and cured, and exposed to up to 500 cycles of wetting and drying. Different parameters were measured as indices for deterioration of concrete durability, i.e. compressive strength, mass reduction and dimensional variations. The results were analyzed and some mathematicalempirical models were proposed for prediction of effect of wetting and drying cycles on concrete deterioration under sulfate ions. It could be concluded from the current study that use of 10% slag and 15% limestone powder, increases the durability of concrete under Magnesium sulfate ions effect. More details will be given in the full paper.

کلمات کلیدی:

Concrete, slag, limestone, magnesium sulfate, wetting and drying cycles