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A Review on Corrosion in Concrete Structure: Inhibiting Admixtures and Their Compatibility in Concrete

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Abstract

The development in marine industry and its effort in building bridges has placed a huge demand on reliability and duration of service of reinforcing steel in concrete. Literature has documented several studies on corrosion of reinforcing steel in concrete induced via carbonation and chloride in marine milieus. Extension of concrete structures service life has been one of the foremost strong worries of the concrete industry, especially for marine industry. Hence, the necessity to employ a cost effect system for shielding the reinforced steel in concrete from corrosion. Studies have shown that one prospective solution in combating corrosion deterioration in reinforced steel in concrete structures is the introduction of corrosion-inhibiting admixtures into concrete. This review discussed at length corrosion in reinforced concrete and corrosion inhibitors in relation to concrete together with the classification of inhibitors based on the method of applications. This review further reports corrosion-inhibiting admixtures in concrete. As a result, the aspects of

corrosion inhibitors this manuscript reviewed are corrosion inhibitors employed as admixtures in concrete for new construction in the marine industry. Furthermore, corrosion inhibitors are employed for repairs and maintenances admixed with concrete for patches on marine structures, squirted onto the surface of the concrete or put on the concrete surface via saturation treatment. As a result of the excellent properties of functional nanostructured materials, the advancement in the implementation of functional materials in inhibiting admixtures in concrete is fast growing in marine industry. Hence, the Integration of functional materials in inhibiting admixture and their compatibility were reviewed. The significance of inhibitors employed as admixtures in concrete for practical applications of corrosion are the suppression or mitigation of corrosion process of metals used in marine industry and the patches of already constructed structures. The current problems related to corrosion-inhibiting admixtures in concrete and the future research and development directions were discussed.

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