World Academy of Science, Engineering and Technology
International Journal of Chemical and Molecular Engineering
Vol:9, No:07, 2015

Investigation of the Inhibition Effect of 2,3-Diaminopyridine on Mild Steel Corrosion in Solution Simulating Water of Pores Concrete in Absence and Presence of Chloride Ions

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Abstract : Corrosion is the result of the reaction between a material and its environment. Steel in concrete is protected from corrosion by a passive film promoted by concrete alkalinity. For the initiation of corrosion, this protective film must be destroyed and this can be mainly done in two ways: by the attack of chlorides on the steel or by carbonation of the cover concrete due the reaction with carbon dioxide, which causes reduction in the alkalinity of concrete. The literature reports several ways to decrease or to prevent reinforcement corrosion. Among them, the use of corrosion inhibitors has been an envisaged solution. Two approaches are generally used to evaluate the efficiency of inhibitors for concrete application; one uses simulated pore solution testing , and the other uses actual concrete or mortar specimens. Both methods are some times used in conjunction. The aim of this study is to investigate the use of 2,3-diaminopyridine as a corrosion inhibitors of steel in alkaline media which simulate the electrolyte in the concrete pores. The effectiveness of this compound as corrosion inhibitor was investigated by measuring the corrosion potentials, the polarization curves and the corrosion current densities of steel with and without chlorides. The study of corrosion inhibition by this compound led to the conclusion that he has low rates of inhibition in the absence of aggressive ions and high rates in their presence. This type of organic compounds are promoting for the protection of armatures in concrete.

Keywords : corrosion, inhibitors, mild steel, conjunction
Conference Title : ICCBE 2015 : International Conference on Chemical and Biological Engineering
Conference Location : Istanbul, Türkiye
Conference Dates : July 29-30, 2015