

Corrosion of Austenitic Stainless Steels in Industrial Phosphoric Acid*

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Abstract

Phosphoric acid (H_3PO_4) is produced at General Fertilizer Company in Homs city by a reaction between phosphate and sulfuric acid (H_2SO_4), forming a thick slurry, which is exposed to filtration to produce polluted Phosphoric acid.

The corrosion behavior of stainless alloys was investigated in phosphoric acid using electrochemical techniques like Tafel polarization. The corrosion rates of these alloys were calculated in polluted phosphoric acid. Measurements & tests have revealed that the effect of polluted phosphoric acid at these alloys is different. Laboratory Tests showed the change in both corrosion rate and corrosion current densities (I_{cor}) according to the existing alloying elements and their percent in the stainless steel alloys.

This research showed the great importance for following studies of the effect of polluted phosphoric acid, produced in General Fertilizer Company, on the high corrosion resisting alloys, to reach suitable alloys for equipments and machines used for its production, because of its high corrosion rates that create many corrosion problems in these equipments and machines.

Key words: Corrosion , phosphoric acid, Electrochemical Behavior, Stainless Steel.

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