

## Corrosion of Welded Stainless Steels and Nickel Alloy in Polluted Industrial Phosphoric Acid Media \*

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### Abstract

Welded joints corrosion phenomena for some kinds of stainless steels and nickel alloy was studied in polluted phosphoric acid 37.7% $H_3PO_4$  using electrochemical techniques like Tafel polarization. Corrosion rate of base metal and weld metal had calculated & compared among these alloys.

Laboratory Test results showed the change in both corrosion rate and corrosion current densities ( $I_{corr}$ ) for tested alloys, and there is a clear difference between base metal and weld metal in most of tested alloys, which lead to high corrosion rates of welded joint, and change in its properties then gets out of service in some service conditions. The stainless steel 904L has low corrosion rates and low difference in corrosion rates between base metal and weld metal, so it may be the most suitable alloy, among all the studied alloys, for exploitation in polluted phosphoric acid 37.7% $H_3PO_4$  produced at the General Fertilizer Company in Homs city.

**Keywords:** Corrosion, Phosphoric Acid, Electrochemical Behavior, Stainless Steel, Welding, Nickel.

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For the Paper in Arabic see pages (335-355)

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