

The effect of magnetic field on copper in various corrosive medium

ABSTRACT

The effect of applied magnetic field on the corrosion behaviour of copper within various corrosive medium is investigated. The copper coupon is immersed in 0.5 M HCl, 0.5 M NaCl and 0.5 M NaOH with or without applying up to 40 mT magnetic fields for 24 hours. The weight loss of copper coupon in HCl increased up to 96.56% with applied magnetic fields. However, in NaOH medium, only 33.33% more weight loss was observed and no difference were observed for coupons in NaCl when magnetic field is applied. This observation indicates that corrosion behaviour in HCl and NaOH is controlled by mass transport that can be influenced by the induced magneto hydrodynamics effect when magnetic field is applied. There was no change in weight loss of copper in NaCl when magnetic field is applied because the corrosion mechanism of copper in NaCl is governed by electron charge transfer.

Keyword: Corrosion; Magnetic field; Copper