

### 论文

#### 3% NaCl溶液中咪唑和苯并三唑对Cu缓蚀协同作用的研究

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#### 摘要:

采用失重法考察了3%NaCl溶液中咪唑和苯并三唑对Cu的缓蚀作用,结果表明100 mg/L的咪唑对Cu的缓蚀率仅为47.7%,100 mg/L的苯并三唑对Cu的缓蚀效率为73.2%,当70 mg/L的咪唑和30 mg/L的苯并三唑复配使用后,其缓蚀效率提高到94.3%,电化学极化曲线研究表明苯并三唑对Cu电极的阳极过程有抑制作用,咪唑对Cu电极的阴极过程有抑制作用,咪唑和苯并三唑的复配使用显著增加了对Cu电极阴极和阳极电化过程的抑制作用。

关键词: 苯并三唑 咪唑 协同作用

#### SYNERGISTIC EFFECTS BETWEEN BENZOTRIAZOLE AND IMIDAZOLE IN CORROSION INHIBITION FOR COPPER IN 3% NaCl SOLUTION

#### Abstract:

The efficiency of imidazole(IM) and benzotriazole(BTA) as corrosion inhibitors for copper in 3%NaCl solution was investigated by weight-loss method. The inhibition efficiency of 100ppm IM for copper was only 47.7%, while the inhibition efficiency of 100ppm BTA for copper was 73.2%. When 70ppm IM and 30ppm BTA were used as complex corrosion inhibitor, inhibition for copper was increased and reached at value of 94.3%. This was beneficial to reduce the deficiency of BTA for its toxicity. Electrochemical polarization curve shows that IM suppressed the cathodic reaction of copper, BTA had inhibition effect for the anodic reaction and the complex inhibitor of IM and BTA suppressed both cathodic and anodic reactions. The molecular structure parameters of IM and BTA were obtained via MM2 forcefield program and PPP-SCF quantum chemical calculation. The electron transfer between IM and BTA was aid to their adsorption and passivity on copper electrode surface. This resulted in the synergistic effects between IM and BTA, improving their protective ability for copper in 3% NaCl solution.

Keywords: benzotriazole imidazole synergistic effect polarization curves PPP SCF calculation

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