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研究报告

盐酸介质中1-丙基-2-甲基-3-烷基苯并咪唑盐对Q235钢的缓蚀作用

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摘要: 合成了不同烷基链长的1-丙基-2-甲基-3-烷基苯并咪唑盐,通过动电位极化曲线、电化学阻抗谱和扫描电镜等方法研究其对Q235钢在1 mol/LHCl中的缓蚀作用。结果表明,1-丙基-2-甲基-3-烷基苯并咪唑盐对Q235钢在盐酸溶液中具有优异的缓蚀性能,其中1-丙基-2-甲基-3-十四烷基苯并咪唑盐的缓蚀性能最好,当浓度达到10mg/L时缓蚀率达98.6%,是以阴极型为主的混合型缓蚀剂。

关键词: 缓蚀剂 苯并咪唑 极化 电化学阻抗谱

INHIBITION OF 1-PROPYL-2-METHYL-3-ALKYL BENZIMIDAZOLE ON Q235 STEEL IN HCl SOLUTION

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Abstract: A New corrosion inhibitors 1-propyl-2-methyl-3-alkyl benzimidazole salts were synthesized and their inhibition for Q235 steel in 1 mol/L HCl solution were investigated by potentiodynamic polarization and electrochemical impedance spectroscopy (EIS). Meanwhile, the surface morphology was studied by scanning electron microscopy(SEM). The results showed that benzimidazole salts had excellent inhibiting efficiency at very low concentration and the inhibiting efficiency increased with the increase of alkyl chain. 1-propyl-2-methyl-3-tetradecyl benzimidazole salts had the highest efficiency among four inhibitors, in which the inhibition efficiency reached up to 98.6% at the concentration of 10 mg/L. These inhibitors acted as mixed inhibitors with cathodic inhibition as dominative action.

Keywords: inhibitor benzimidazole polarization electrochemical impedance spectrum

收稿日期 2011-01-18 修回日期 2011-03-06 网络版发布日期 2012-04-16

DOI:

基金项目:

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参考文献:

[1] Zhou X X, Liu J P. Present state of the application of corrosion inhibitors to acid pickling and its development trend[J].Industr. Water Treatment, 2002, 22(1): 16-19

周晓湘, 刘建平.酸洗缓蚀剂的应用研究现状及发展趋势[J]. 工业水处理, 2002, 22(1):16-19)


[2] Zhang S T, Xue M Y, Wang Y B, et al. Study on covering behavior of BTA inhibitor on pure copper surface[J].

张胜涛, 薛名月, 王艳波等. 苯并三氮唑在铜表面覆盖行为的研究[J]. 腐蚀科学与防护技术, 2006, 18(5): 313-316) [浏览](#)

- [3] Zhao W, Zhang J P, Yin C X, et al. Corrosion inhibition mechanism of benzotriazole derivatives for N80 steel in HCl solution [J]. Corros. Sci. Prot. Technol., 2007, 19(4): 251-254


赵雯, 张军平, 尹成先等. 盐酸介质中苯并三氮唑衍生物的缓蚀机理研究[J]. 腐蚀科学与防护技术, 2007, 19(4): 251-254) [浏览](#)


- [4] Raicheva S N, Aleksiev B V, Sokolova E I. The effect of the chemical structure of some nitrogen and sulphur containing organic compounds on their corrosion inhibiting action [J]. Corros.Sci., 1992, (2): 343-350


- [5] Khaled K F. The inhibition of benzimidazole derivatives on corrosion of iron in 1 M HCl solutions [J]. Electrochim. Acta, 2003,48: 2493-2503 

- [6] Shi Z L, Pang Z Z. Efficiency of arylsubstituted-benz-imidazoles as copper corrosion inhibitors in HCl solution [J]. J. Beijing Univ. Chem. Technol., 2002, 29(2):52-54

史志龙, 庞正智. 新型铜酸洗缓蚀剂烷基苯并咪唑的研究[J]. 北京化工大学学报, 2002, 29 (2): 52-54)

- [7] Ashassi-Sorkhabi H, Majidi M R, Seyyedi K. Investigation of inhibition effect of some amino acids against steel corrosion in HCl solution [J]. Appl. Surf. Sci., 2004, 225: 176-185 

- [8] Solmaz R, Kardas G, Yazici B, et al. Adsorption and corrosion inhibitive properties of 2-amino-5-mercapto-1, 3, 4-thiadiazole on mild steel in hydrochloric acid media [J]. Colloids Surf. A: Physicochem. Eng. Aspects, 2008, 312: 7-17 

- [9] Aljourani J, Raeissi K, Golozar M A. Benzimidazole and its derivatives as corrosion inhibitors for mild steel in 1 mol/L HCl solution [J]. Corros. Sci., 2009, 51: 1836-1843 

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[J]. 中国腐蚀与防护学报, 2015,(8): 0-0

2. 雍兴跃, 李栋梁, 张晓云, 刘明, 孙志华, 张永顺. 两种氧化处理的铝合金空泡腐蚀行为的差异[J]. 中国腐蚀与防护学报, 2012,24(2): 95-100

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5. 李晓丹, 翟玉春, 邱峰, 刘涛涛. 纳米SiC颗粒强化7075铝合金在NaCl溶液中的电化学腐蚀行为[J]. 中国腐蚀与防护学报, 2012,24(2): 139-143

6. 李凤歧, 曹小明, 田冲, 张劲松. SiC/钢双连续相复合材料在NaCl溶液中的腐蚀行为[J]. 中国腐蚀与防护学报, 2012,24(2): 122-126

7. 刘月学, 刘烈炜, 董猛, 张大同. 缓蚀剂分子结构与抗硫性能及其缓蚀机理研究[J]. 中国腐蚀与防护学报, 2012,32(2): 151-156

8. 董猛, 刘烈炜, 刘月学, 张大同. 高温高压H₂S/CO₂环境缓蚀剂分子结构与缓蚀性能关系的研究[J]. 中国腐蚀与防护学报, 2012,32(2): 157-162

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