

研究论文

咪唑对锌缓蚀机理的表面增强拉曼光谱研究

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摘要 利用电化学现场表面增强拉曼光谱技术(SERS)研究了咪唑在锌表面的成膜和缓蚀行为, 讨论了电位和pH值对咪唑分子和金属表面作用的影响。锌电极上的表面拉曼光谱研究结果表明, 中性溶液中咪唑对锌的缓蚀作用明显, 它通过氮端垂直吸附在锌表面, 从而阻止锌的腐蚀, 其吸附取向不随电位的变化而改变; 在碱性溶液中咪唑和锌的作用较弱, 而且电位变化可以使其吸附取向发生改变, 在较正电位下咪唑以氮端垂直吸附, 在较负电位下以咪唑环倾斜吸附。

关键词 [锌电极](#) [咪唑](#) [缓蚀](#) [表面增强拉曼光谱](#)

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Surface-enhanced Raman Spectroscopic Studies on the Inhibition Mechanisms for Imidazole on Zinc Surfaces

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Abstract Surface-enhanced Raman spectroscopy(SERS) was employed to study the surface layers formation and inhibition behavior of imidazole at zinc electrode. The inhibition mechanism of imidazole on zinc surfaces was investigated with the variations in potential and pH. The results reveal that imidazole absorbed on the zinc surface by its N atom with perpendicular orientation in a wide potential region in the solutions with pH=8.53. In alkaline solution with pH=11.40, imidazole was absorbed on the zinc surface by its N atom in a perpendicular position at a relative positive potential. With the negative movement of potential, the orientation was changed in which the ring was slightly tilted on the surface. Imidazole exhibited a higher effective inhibition on zinc in neutral solution than that in alkaline solution due to the strong interaction with zinc for the former.

Key words [Zn electrode](#) [Imidazole](#) [Inhibition](#) [Surface-enhanced Raman spectroscopy\(SERS\)](#)

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