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电解锌的SO₂阳极反应动力学

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摘要: 研究了湿法炼锌电解过程中, 用SO₂在阳极放电代替传统的水分解放电而降低槽电压, 以达到节能的目的。使用铂作阳极, 在电解液中通入SO₂进行电解, 节能可达40%。通过SO₂阳极极化曲线的测定, 考察了SO₂浓度、H₂SO₄浓度、温度和搅拌速度对阳极反应速率的影响。研究表明: 在铂阳极上SO₂阳极反应符合电化学控制, 遵从塔菲尔公式; SO₂的反应级数为3.3, 表观活化能为31.8 kJ/mol, 硫酸的反应级数为零。

关键字: 锌电解; SO₂阳极反应; 动力学; 节能

SO₂ anodic reaction kinetics in zinc electrowinning

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Abstract: The anodic oxidation of sulfur dioxide instead of water in zinc hydrometallurgy was studied for energy saving. The experimental results show that under experimental conditions energy consumption can be reduced by 40%. The effects of SO₂ concentration, H₂SO₄ concentration, temperature and stirring speed on anodic reaction rate were investigated using potentiostatic polarization measurement. The results indicate that the SO₂ anodic reaction process is electrochemically controlled and obeys Tafel equation. The apparent activation energy for SO₂ anodic reaction is 31.8 kJ/mol, and the orders of anodic reaction are 3.30 and zero with respect to SO₂ and H₂SO₄ respectively.

Key words: zinc electrowinning; SO₂ anodic reaction; kinetics; energy saving

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