

研究简报

钒液流电池用石墨毡电极电化学活化机理的交流阻抗研究

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摘要 研究了不同氧化程度下的石墨毡在钒溶液中的吸附性、润湿性及其交流阻抗图谱(EIS), 结果发现随着氧化程度增加, 吸附性和润湿性增强; 交流阻抗谱包括两个半圆和一条直线, 高频半圆对应离子的吸脱附反应, 低频半圆对应电化学反应, 直线对应离子在溶液中的扩散过程. 随石墨毡氧化程度的增加, 低频半圆显著减小, 通过等效电路拟合及动力学参数计算, 发现电荷传递电阻显著减小.

关键词 [电池](#) [石墨毡](#) [电化学氧化](#) [交流阻抗](#) [吸附](#)

分类号

Activation Mechanism Study of Electrochemical Treated Graphite Felt for Vanadium Redox Cell by Electrochemical Impedance Spectrum

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Abstract The adsorption properties, wetting ability and electrochemical impedance spectrum properties of graphite felts in vanadium electrolyte were investigated. The results show that adsorption property and wetting ability were increased with increasing the extent of oxidation. The alternating current impedance diagram consists of two semi circles and a line, in which the high frequency zone was ascribed to adsorption process within porous structure and the low frequency zone to the kinetic impedance of electrochemical reaction. The higher the extent of oxidation, the smaller the semi circle in the low frequency zone. The changes in the value of electrochemical impedance can be explained by the increase of COOH group on the graphite felt surfaces after electrochemical oxidation. The equivalent circuits of graphite felt electrode were proposed and the corresponding simulated kinetic parameters were also discussed.

Key words [vanadium redox cell](#) [graphite felt](#) [electrochemical oxidation](#) [AC impedance](#) [adsorption](#)

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