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粉末微电极方法研究DMcT/PAn的电化学性能

邓凌峰, 李新海, 肖立新, 张云河, 何则强, 侯桃丽

(中南大学冶金科学与工程学院, 湖南长沙, 410083)

摘要: 用粉末微电极方法研究DMcT, PAn及DMcT/PAn的电化学性能. 在有PAn存在时, DMcT的氧化还原峰电位差由1.90 V降至0.07 V, 表明DMcT的电化学氧化还原反应速度加快. DMcT/PAn的电化学阻抗(123Ω)比DMcT的电化学阻抗(948Ω)小得多, 说明PAn对DMcT的电化学氧化还原反应具有电催化作用. 同时, DMcT使PAn在较高的电压时(大于4.0 V, vs Li/Li+)能保持电化学活性, 而且经过100次循环后, 循环伏安(CV)曲线几乎没有变化, 表明DMcT/PAn具有优良的循环稳定性和可逆性. 比较粉末微电极的CV曲线和常规尺寸电极的CV曲线, 粉末微电极能真实地反映PAn和DMcT复合时的氧化还原反应特性.

关键词: 聚苯胺; DMcT; PAn; 电催化; 粉末微电极; 循环伏安; 交流阻抗

Electrochemical properties of DMcT/ PAn with powder microelectrodes

DENG Ling-feng, LI Xin-hai, XIAO Li-xin, ZHANG Yun-he, HE Ze-qiang, HOU Tao-li

(College of Metallurgical Science and Engineering, Central South University, Changsha 410083, China)

Abstract: The electrochemical properties of DMcT, PAn, and DMcT/PAn were investigated via powder microelectrodes. The results show that the redox peak-potential of DMcT/PAn (0.07 V) is less than that (1.9 V) of DMcT, which indicates the redox reaction of DMcT is accelerated greatly by PAn. PAn shows also a great electrochemical catalysis on the reaction of DMcT from the fact that charge-transfer resistance of DMcT/PAn (123Ω) is less than that (948Ω) of DMcT. In the meantime, DMcT can maintain the electrochemical activity of PAn at voltage above 4.0 V (vs Li/Li+), and its cyclic voltammogram is almost unchanged after 100 circles, indicating that DMcT/PAn possesses excellent cycle stability and reversibility. Compared with the cyclic voltammogram of DMcT/PAn via conventional electrodes, DMcT/PAn via powder microelectrodes can reflect accurately and truthfully the electrocatalytic effects of PAn on the reaction of DM-cT.

Key words: polyaniline; DMcT; PAn; electrocatalysis; powder microelectrode; cyclic voltammetry; AC impedance

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地 址：湖南省长沙市中南大学 邮编： 410083

电 话： 0731-88879765 传真： 0731-88877727

电子邮箱： zngdxb@mail.csu.edu.cn 湘ICP备09001153号