化工学报 2004 55 (7): 1140-1144 ISSN: 0438-1157 CN: 11-1946/TQ

表面与界面工程

多孔金属连续电沉积数学模型

王殿龙, 戴长松, 吴宁, 姜兆华

哈尔滨工业大学应用化学系，黑龙江 哈尔滨 150001

收稿日期 2003-4-9 修回日期 2003-8-7 网络版发布日期 2008-9-1 接受日期

摘要 采用电沉积方法制备连续多孔金属, 通过把电流密度随时间的变化转换为镀区内的位置分布，建立了稳恒状态下高孔率带状多孔金属连续电沉积动态模型，推导出表观电流密度分布的数学表达式. 并在多孔金属镍实际制备过程中对模型进行了验证，结果表明带状多孔金属与阳极配置满足一定角度时，实现阴极表观电流密度恒定，镍的结晶细致. 这一工作为电沉积法制备多孔金属的在线控制提供了理论依据.

关键词 多孔金属 表观电阻 连续电沉积 电流密度

分类号

MATHEMATICAL MODEL OF CONTINUOUS ELECTRODEPOSITION OF POROUS METAL

WANG Dianlong,DAI Changsong,WU Ning,JIANG Zhaohua

Abstract

In order to prepare the continuous porous metal by electrodeposition, a mathematical model of continuous electrodeposition of strip porous metal under steady state was deduced,based on the transition from time variable to location variable.Furthermore the expression of apparent distribution for current density was derived. This relationship was verified experimentally from the preparation of porous nickel. When the angle between porous metal strip and anode configuration conformed to the same angle the apparent current density could be kept constant, and nickel crystal was compact.This work provided the theoretical foundation of on-line control in preparing porous metal by electrodeposition.

Key words porous metal apparent resistance continuous electrodeposition current density

DOI:

通讯作者 王殿龙 dlwang@hit.edu.cn