

论文

等离子镍铬表面合金化合金元素利用率研究

贺志勇,赵晋香,高原

太原理工大学表面工程研究所

摘要:

采用双层辉光离子渗金属技术在20钢上进行镍铬共渗处理,对合金元素的溅射和吸收这两个渗金属过程,从放电及溅射等理论角度并结合试验结果进行了分析讨论。结果表明,放电条件对渗层形成效率有很大影响,合金元素的利用率在不同的放电参数下会有悬殊的变化。溅射量决定于溅射电压与气压,利用率则受工件偏压、气压、极间距的共同控制。在一定的溅射量下,利用率的高低决定了渗层质量及形成效率。提高合金元素的利用率是工艺参数选择的最重要目标。

关键词: 辉光放电 溅射 表面合金化

STUDY ON ABSORPTION RATIO OF ALLOY ELEMENTS IN PLASMA Ni-Cr ALLOYING BY DOUBLE GLOW PLASMA PROCESS

Zhiyong He, , ,

太原理工大学表面工程研究所

Abstract:

Plasma Ni-Cr surface alloying was applied on mild steel by double Glow Plasma Surface Alloying Process.The sputtering and absorption of alloy elements,two basic processes that determined the kinetics of the alloying process,were investigated on the basis of discharge and sputtering theories and the experient results.The study indicated that the alloying process was effected remarkably by the discharge parameters.The sputtering efficiency of the sputtering target was determined by the voltage applied on it and also the discharge pressure.High voltage and low discharge pressure and substrate bias should be chosen moderately to obtain the highest efficiency of the alloying process,the optimums being 40Pa and 400V respectively.Besides,the distance between sputtering target and substrate also affected the absorption ratio.Reduving distance was beneficial to the absorption process especially when it was at 20mm or shorter.The close correlation between the distance and the absorption ratio might result in the non-uniformity of the alloyed layer since it was inevitable that there would be some difference in the distance in practical operations.so the selection of distance should be considered in association with the specific processing condition.With certain sputtering supply of alloy elements,the larger the ratio of the absorption,the higher the quality of the alloyed layer.The absorption ratio should be the main concern with respect to the optimization of the rocessing coditions.

Keywords: glow discharge sputtering surface alloying

收稿日期 1998-12-31 修回日期 1900-01-01 网络版发布日期 1999-12-25

DOI:

基金项目:

通讯作者: 贺志勇

作者简介:

本刊中的类似文章

1. 张弘, 苏永安, 古凤英 .钨在不同温度下形成的辉光离子渗镀层的特性[J]. 中国腐蚀与防护学报, 2000,20(1): 59-63
2. 袁庆龙, 张跃飞, 苏永安, 池成忠, 唐宾, 徐重 .纯铜等离子渗钛层的氧化机理分析[J]. 中国腐蚀与防护学报, 2005,25(2): 102-105

扩展功能

本文信息

Supporting info

PDF(153KB)

[HTML全文](1KB)

参考文献[PDF]

参考文献

服务与反馈

把本文推荐给朋友

加入我的书架

加入引用管理器

引用本文

Email Alert

文章反馈

浏览反馈信息

本文关键词相关文章

▶ 辉光放电

▶ 溅射

▶ 表面合金化

本文作者相关文章

▶ 贺志勇

▶ 赵晋香

▶ 高原