

目 次 CONTENTS

专题——轻合金微弧氧化技术

Special Topic—Micro-arc Oxidation of Light Alloy

1 电压对 TiAl 合金含 ZrO₂ 微弧氧化膜生长特性的影响

Effect of Voltage on Growth Characteristics of Ceramic Coating Containing ZrO₂ Prepared by Microarc Oxidation on TiAl Alloy

郭超飞, 郝建民, 陈永楠, 陈宏, 丁业立

GUO Chao-fei, HAO Jian-min, CHEN Yong-nan, CHEN Hong, DING Ye-li

6 TC4 在锆盐体系下微弧氧化膜层的生长特性研究

Growth Characteristic of Micro-arc Oxide Coating on TC4 in Zirconium Salt System

周勤勤, 郝建民, 陈永楠, 陈宏, 丁业立

ZHOU Qin-qin, HAO Jian-min, CHEN Yong-nan, CHEN Hong, DING Ye-li

12 二次电压对 AZ91D 镁合金微弧氧化封孔的影响

Effect of Secondary Voltage on Micro-arc Oxidation Sealing of AZ91D Magnesium Alloy

陈宏, 黄杰, 陈永楠, 郝建民, 张鸽

CHEN Hong, HUANG Jie, CHEN Yong-nan, HAO Jian-min, ZHANG Ge

17 基于 COMSOL 的微弧氧化过程温度场分布研究

Temperature Field Distribution of Micro-arc Oxidation Process Based on COMSOL

姜曼, 柴永生, 周京, 牟玲龙, 岳艳丽

JIANG Man, CHAI Yong-sheng, ZHOU Jing, MOU Ling-long, YUE Yan-li

23 铝基板表面微弧氧化膜厚度对其导电导热性的影响

Effect of Oxide Film Thickness on Electrical and Thermal Conductivity of Micro-arc Oxidized Aluminium Substrates

张博, 蔡辉, 张阳, 孙万昌, 张菊梅

ZHANG Bo, CAI Hui, ZHANG Yang, SUN Wan-chang, ZHANG Ju-mei

28 外科植入物微弧氧化层中引入元素定量检测方法的研究

Quantitative Detection Method of Introduced Elements in Micro-arc Oxidation Layer of Surgical Implants

虞崇庆, 何涛, 贾晓航, 张莉, 文燕

YU Chong-qing, HE Tao, JIA Xiao-hang, ZHANG Li, WEN Yan

34 镁合金微弧氧化工艺参数研究

Process Parameters of Magnesium Alloys Micro-arc Oxidation

陈宏, 郭亚欣, 宫月, 陈永楠, 林洪才

CHEN Hong, GUO Ya-xin, GONG Yue, CHEN Yong-nan, LIN Hong-cai

40 纳米 BN 对 1060 铝微弧氧化膜层性能的影响

Effect of Nano BN Additive on Performance of Micro-arc Oxide Film Formed on 1060 Aluminum

魏国栋, 曹晓明, 马瑞娜, 李世杰, 张俊伟

WEI Guo-dong, CAO Xiao-ming, MA Rui-na, LI Shi-jie, ZHANG Jun-wei

47 基于扫描式阴极的 TC4 合金微弧氧化行为研究

Micro-arc Oxidation Behavior of TC4 Alloy Based on Scanning Cathode

王小龙, 孙祚东, 朱辰

WANG Xiao-long, SUN Zuo-dong, ZHU Chen

专题——复合涂层及其制备技术

Special Topic—Composite Coatings and Its Preparation Technology

52 TA2 合金激光熔 α -Ti/TiC+(Ti,W)C_{1-x}/Ti₂SC+TiS 自润滑耐磨复合涂层

Laser Cladding α -Ti/TiC+(Ti,W)C_{1-x}/Ti₂SC+TiS Self-lubricating Wear-resistant Composite Coating on TA2 Alloy

乔世杰, 刘秀波, 翟永杰, 徐江宁, 高伟强, 姚志远

QIAO Shi-jie, LIU Xiu-bo, ZHAI Yong-jie, XU Jiang-ning, GAO Wei-qiang, YAO Zhi-yuan

58 工艺参数对电沉积制备铝镁合金的影响

Effects of Technological Parameters on Aluminum-Magnesium Alloys Prepared by Electrodeposition

阚洪敏, 祝跚珊, 冯筱珺, 张宁, 王晓阳, 龙海波

KAN Hong-min, ZHU Shan-shan, FENG Xiao-jun, ZHANG Ning, WANG Xiao-yang, LONG Hai-bo

66 球磨纳米结构 Fe40Al 合金粉末及其冷喷涂沉积行为研究

Ball-milled Nanostructured Fe40Al Alloy Powder and Its Deposition Behavior in Cold Spray Process

王洪涛, 姚海龙, 纪岗昌

WANG Hong-tao, YAO Hai-long, JI Gang-chang

75 电沉积制备镍基复合镀层的研究进展

Research Progress of Ni-based Composite Coatings Prepared by Electrodeposition

冯筱珺, 阚洪敏, 魏晓冬, 张宁, 王晓阳, 龙海波

FENG Xiao-jun, KAN Hong-min, WEI Xiao-dong, ZHANG Ning, WANG Xiao-yang, LONG Hai-bo

83 基于 RSM 的电铸自支撑金刚石-镍复合膜参数优化

RSM-based Parameter Optimization of Electrotyping Free-standing Diamond-Nickel Composite Film

禹建丽, 黄鸿琦, 陈洪根

YU Jian-li, HUANG Hong-qi, CHEN Hong-gen

88 合金钢热障涂层等离子喷涂及高温力学特性研究

Preparation and Mechanical Behavior at High Temperature of Plasma Sprayed Thermal Barrier Coatings on Alloyed Steel

赵子鹏, 李忠盛, 张新华, 盖鹏涛, 何庆兵, 张隆平, 田武强

ZHAO Zi-peng, LI Zhong-sheng, ZHANG Xin-hua, GAI Peng-tao,

HE Qing-bing, ZHANG Long-ping, TIAN Wu-qiang

94 纶云母和硅烷偶联剂 KH550 对聚氨酯/Al-Sm₂O₃复合涂层耐盐水性能的影响

Effects of Sericite and Silane Coupling Agent KH550 on Saline Water Resistance of Polyurethane/Al-Sm₂O₃ Composite Coatings

赵运林, 张伟钢

ZHAO Yun-lin, ZHANG Wei-gang

99 SiO₂气凝胶复合型隔热涂层的制备及性能研究

Preparation and Properties of SiO₂ Aerogel Composite Thermal Insulation Coatings

丁逸栋, 刘朝辉, 王飞, 贾艺凡, 舒心

DING Yi-dong, LIU Zhao-hui, WANG Fei, JIA Yi-fan, SHU Xin

106 KCJ-15 扬雪机搅笼镍基喷熔复合涂层的研究

NiCrBSiC Spray-fused Composite Coating of KCJ-15 Snow Lifting Mixer

曾锐, 林振荣, 张勇, 王瑞

ZENG Rui, LIN Zhen-rong, ZHANG Yong, WANG Rui

111 碳纳米管-镍磷化学复合镀层的组织与性能研究

Microstructure and Properties of Ni-P-Carbon Nanotube Composite Coating Subject to Electroless Plating

王敏, 黄燕滨, 王期超, 卢士勇

WANG Min, HUANG Yan-bin, WANG Qi-chao, LU Shi-yong

116 反应等离子喷涂 AlNbO₄-Al₂O₃-NbO_x复合涂层的研究

AlNbO₄-Al₂O₃-NbO_x Composite Coating Prepared by Reactive Plasma Spraying

卜丽静, 张建新, 燕朔江, 朱朝刚, 杨勇, 褚振华, 董艳春, 何继宁, 刘娜

BU Li-jing, ZHANG Jian-xin, YAN Shuo-jiang, ZHU Chao-gang, YANG Yong,

CHU Zhen-hua, DONG Yan-chun, HE Ji-ning, LIU Na

121 复合型建筑节能涂层的制备及性能研究

Preparation and Properties of Composite Type Building Energy-saving Coatings

邓安仲, 杨光

DENG An-zhong, YANG Guang

127 等离子喷涂 TiO₂-CaF₂复合涂层的结构及体外生物矿化能力

Microstructures and In-vitro Biomimetic Ability of Plasma-sprayed TiO₂-CaF₂ Composite Coatings

彭超, 赵晓兵

PENG Chao, ZHAO Xiao-bing

表面强化及功能化 Surface Strengthening and Functionalization

133 铝合金表面微/纳米结构构筑研究进展

Research Progress in Fabricating Micro/Nano Structures on Aluminum Alloys Surface

吴英豪, 赵文杰, 王武荣, 张彦彦, 李龙阳, 薛群基

WU Ying-hao, ZHAO Wen-jie, WANG Wu-rong, ZHANG Yan-yan, LI Long-yang, XUE Qun-ji

146 微波合成 WC_x/MWCNTs 及其电催化性能研究

Preparation of WC_x/MWCNTs by Microwave and Its Electrocatalytic Property

宁哲, 李卓, 宋华, 刘坤, 韩露, 王一雍, 李继东, 万兴元, 路金林

NING Zhe, LI Zhuo, SONG Hua, LIU Kun, HAN Lu, WANG Yi-yong, LI Ji-dong, WAN Xing-yuan, LU Jin-lin

152 静压力对超声滚压表层特性的影响

Effect of Static Pressure on Surface Characteristics of Ultrasonic Rolling

赵运才, 张飞

ZHAO Yun-cai, ZHANG Fei

159 微弧火花沉积制备不锈钢柱状微结构表面

Fabrication of Stainless Steel Microstructure Surface by Electro-spark Deposition

王维夫, 谢剑舟, 张步康, 阮文豪, 韩超

WANG Wei-fu, XIE Jian-zhou, ZHANG Bu-kang, RUAN Wen-hao, HAN Chao

165 Ti6Al4V 钛合金表面真空渗氧处理

Vacuum Oxidation Treatment on Ti6Al4V Titanium Alloy

杨闯, 刘静, 马亚芹, 肖发琴

YANG Chuang, LIU Jing, MA Ya-qin, XIAO Fa-qin

171 化学刻蚀制备亲水性铝及润湿性变化规律

Hydrophilic Aluminum Prepared by Chemical Etching and Its Wettability Change Rule

赵丕阳, 王岩伟, 任青文, 董一, 翟晓庆, 朱光明

ZHAO Pi-yang, WANG Yan-wei, REN Qing-wen, DONG Yi, ZHAI Xiao-qing, ZHU Guang-ming

177 高折射率锐钛矿 TiO₂薄膜的低温直流磁控溅射制备技术

Preparation Technology of High Refractive Index Anatase TiO₂ Film by Low Temperature Magnetron Sputtering Technique

王朝勇, 任一新, 李琦轩, 李智, 王新练, 黄晓亚, 姚宁

WANG Zhao-yong, REN Yi-xin, LI Qi-xuan, LI Zhi, WANG Xin-lian, HUANG Xiao-ya, YAO Ning

- 184 阳极氧化铝膜的表面接枝改性及润湿行为
Surface Grafting Modification and Wetting Behavior of Anodic Aluminum Oxide Film
杨清香, 任爽爽, 赵倩倩, 董梦果, 张琰, 宋海媚, 陈志军
YANG Qing-xiang, REN Shuang-shuang, ZHAO Qian-qian, DONG Meng-guo,
ZHANG Yan, SONG Hai-mei, CHEN Zhi-jun
- 189 氧化铁/氮掺杂碳纳米管催化剂的制备与氧还原性能研究
Preparation and Oxygen Reduction Reaction Performance of Iron Oxide/Nitrogen Doped Carbon Nanotube Catalyst
张颖, 李萍炜, 尹徐影, 赵斌
ZHANG Ying, LI Ping-wei, YIN Xu-ying, ZHAO Bin
- 196 固化工艺对无取向环保硅钢绝缘涂层性能的影响
Influence of Curing Process on Performance of Eco-friendly Non-oriented Silicon Steel Insulating Coating
安恺, 王雷, 崔珊, 刘常升
AN Kai, WANG Lei, CUI Shan, LIU Chang-sheng
- 202 超亲水及水下超疏油铜网的制备及其油水分离性能的研究
Fabrication of Superhydrophilic and Underwater Superoleophobic Copper Mesh and Oil/Water Separation Property
张容容, 刘长松, 杨亭亭
ZHANG Rong-rong, LIU Chang-song, YANG Ting-ting
- 209 浸润性可转变的超疏水织物用于油水分离研究
Application of Superhydrophobic Fabric of Reversible Wettability in Oil-Water Separation
郭素明, 蔡再生, 牟晓峰
GUO Su-ming, CAI Zai-sheng, MOU Xiao-feng
- 215 纳米陶瓷的研究进展
Research Progress of Nano-ceramic
张强宏
ZHANG Qiang-hong

表面失效及防护 Surface Failure and Protection

- 224 聚苯胺/磷酸锌/聚硅氧烷复合涂层自修复和耐蚀性能初探
Self-healing Function and Corrosion Resistance of Polyaniline/Zinc Phosphate/Polysiloxane Composite Coatings
甘志宏, 廖圣智, 王浩伟, 余剑英, 邵亚薇
GAN Zhi-hong, LIAO Sheng-zhi, WANG Hao-wei, YU Jian-ying, SHAO Ya-wei
- 231 40Cr 钢表面 TEOS 改进硅烷膜的制备及其耐腐蚀性能研究
Preparation and Corrosion Resistance of TEOS-Modified Silane Film on 40Cr Steel Surface
刘敬春, 赵衍涛, 孙中浩, 赵永武
LIU Jing-chun, ZHAO Yan-tao, SUN Zhong-hao, ZHAO Yong-wu
- 238 热喷涂 Fe 基非晶涂层耐腐蚀性与孔隙率研究进展
Porosity and Corrosion Resistance of Fe-based Amorphous Coatings Prepared by Thermal Spraying
姜超平, 刘王强
JIANG Chao-ping, LIU Wang-qiang
- 244 汽车油冷器典型失效分析
Typical Defects Analysis of Automotive Oil Cooler
徐强, 金喆民, 顾国荣, 刘欣, 王文东
XU Qiang, JIN Zhe-min, GU Guo-rong, LIU Xin, WANG Wen-dong

表面质量控制及检测 Surface Quality Control and Detection

- 249 基于 K-SVD 算法的带钢表面缺陷图像去噪
Image Denoising of Strip Steel Surface Defects Based on K-SVD Algorithm
崔东艳, 高蔚庭, 夏克文
CUI Dong-yan, GAO Wei-ting, XIA Ke-wen
- 255 哈氏合金 C-276 电抛光中抛光液的失效分析
Failure Analysis of Electrolyte in E-polishing Process of Hastelloy Alloy C-276
胡宗林, 陆玲, 庄维伟
HU Zong-lin, LU Ling, ZHUANG Wei-wei
- 261 抛光液 pH 值、温度和浓度对蓝宝石抛光效率的影响
Effect of Slurry pH, Temperature and Concentration on Removal Efficiency of Sapphire Material
董双阳, 颜志强, 刘祖耀, 冉红锋, 张俭, 屠锡富, 黄勇, 杨春光
DONG Shuang-yang, YAN Zhi-qiang, LIU Zu-yao, RAN Hong-feng, ZHANG Jian,
TU Xi-fu, HUANG Yong, YANG Chun-guang
- 266 无机固体润滑处理热镀锌板在汽车中的应用
Application of Hot Dip Galvanized Plate Subject to Inorganic Solid Lubrication in Automotive Industry
李双一, 王光, 刘翰志, 任晓辉
LI Shuang-yi, WANG Guang, LIU Han-zhi, REN Xiao-hu