

目次 CONTENTS

特邀综述 Invited Review

1 化学机械抛光液的研究进展

Research Progress of Chemical Mechanical Polishing Slurry

孟凡宁, 张振宇, 郜培丽, 孟祥东, 刘健

MENG Fan-ning, ZHANG Zhen-yu, GAO Pei-li, MENG Xiang-dong, LIU Jian

专题——液相等离子体电解-微弧氧化表面改性技术

Special Topic—Surface Modification Technology of Liquid-phase Plasma Electrolysis-Micro Arc Oxidation

11 锆微弧氧化表面处理技术研究进展

Advance in Microarc Oxidation Surface Treatment on Zr

魏克俭, 薛文斌, 曲尧, 王兴平, 杜建成

WEI Ke-jian, XUE Wen-bin, QU Yao, WANG Xing-ping, DU Jian-cheng

24 微弧氧化技术在热控涂层中的应用

Application of Micro-arc Oxidation Technology in Thermal Control Coating

李响, 姚忠平, 李雪健, 徐鸿, 夏琦兴, 陈昌举, 姜兆华

LI Xiang, YAO Zhong-ping, LI Xue-jian, XU Hong,

XIA Qi-xing, CHEN Chang-ju, JIANG Zhao-hua

37 金属表面液相等离子体电解渗硼技术

Plasma Electrolytic Boriding Technology on Surface of Metals

王彬, 薛文斌, 金小越, 杜建成

WANG Bin, XUE Wen-bin, JIN Xiao-yue, DU Jian-cheng

49 镁合金微弧氧化的研究现状

Research Status of Micro-arc Oxidation of Magnesium Alloy

陈宏, 王成成, 康亚斌, 朱晓宇, 陈斌博, 陈永楠, 郝建民

CHEN Hong, WANG Cheng-cheng, KANG Ya-bin, ZHU Xiao-yu,

CHEN Bin-bo, CHEN Yong-nan, HAO Jian-min

61 微弧氧化膜封孔技术研究进展

Research Progress of Pore Sealing Technology for Micro-arc Oxidation Films

刘朋, 刘群峰, 黄德群, 顾珩, 刘志聘

LIU Peng, LIU Qun-feng, HUANG De-qun, GU Heng, LIU Zhi-dan

72 TA15 合金微弧氧化陶瓷涂层制备与电偶腐蚀性能

Preparation and Galvanic Corrosion Resistance of Microarc Oxidation Ceramic Coatings on TA15 Alloy

周科, 王树棋, 娄霞, 邹永纯, 张鹏飞, 王亚明

ZHOU Ke, WANG Shu-qi, LOU Xia, ZOU Yong-chun, ZHANG Peng-fei, WANG Ya-ming

81 钛合金表面高硬度微弧氧化膜的制备和耐磨性研究

Fabrication and Wear Resistance of Hard Micro Arc Oxidation Coatings on Ti Alloys

齐玉明, 彭振军, 刘百幸, 梁军, 王鹏

QI Yu-ming, PENG Zhen-jun, LIU Bai-xing, LIANG Jun, WANG Peng

89 纳米 ZrO₂ 微粒对 TC4 合金表面微弧氧化陶瓷膜层耐蚀及耐磨性能的影响

Effect of Nano-ZrO₂ Particles on Corrosive and Abrasive Performances of the Micro-arc Oxidized Ceramic Film on TC4 Alloy Surface

才文兰, 史海兰, 王振霞, 贺志勇, 刘小萍, 林乃明

CAI Wen-lan, SHI Hai-lan, WANG Zhen-xia, HE Zhi-yong, LIU Xiao-ping, LIN Nai-ming

97 铝酸盐溶液对 TiAl 合金微弧氧化膜生长和膜层特性的影响
Effect of Aluminate Electrolyte on Growth and Properties of Micro-arc Oxidation Coating on TiAl Alloy

李夕金, 薛文斌
LI Xi-jin, XUE Wen-bin

104 硅酸钠浓度对 Ti₃Al 基合金微弧氧化层生长及其摩擦磨损性能的影响
Effect of Na₂SiO₃ Concentration on Growth and Friction and Wear Properties of Micro-arc Oxide Coatings on Ti₃Al-based Alloys

贾文婷, 王文波, 田林海, 王晓云, 常勇强, 张伟樯, 聂勇
JIA Wen-ting, WANG Wen-bo, TIAN Lin-hai, WANG Xiao-yun,
CHANG Yong-qiang, ZHANG Wei-qiang, NIE Yong

112 DLC 薄膜沉积对不同表面形貌的钛微弧氧化膜层摩擦学性能的影响
Influence of DLC Film Deposition on the Tribological Property of Micro-arc Oxidation Films with Different Surface Morphologies on Titanium

李云玉, 任西鹏, 陈兆祥, 李浩, 任丽梅
LI Yun-yu, REN Xi-peng, CHEN Zhao-xiang, LI Hao, REN Li-mei

122 微弧氧化处理对钛-钢电偶腐蚀行为的影响
Effect of Micro-arc Oxidation Treatment on Behavior of Galvanic Corrosion between Titanium and Steel

胡裕龙, 卜世超, 王智娇
HU Yu-long, BU Shi-chao, WANG Zhi-qiao

135 负电压对 2A50 铝合金微弧氧化陶瓷层微观结构和耐磨性能的影响
Effect of Negative Voltage on Microstructure and Wear Resistance of MAO Ceramic Coatings on 2A50 Aluminum Alloy

李小晶, 文帅, 符博洋, 毛昕, 张敏, 王启伟, 陈平
LI Xiao-jing, WEN Shuai, FU Bo-yang, MAO Xin, ZHANG Min, WANG Qi-wei, CHEN Ping

142 6061 铝合金表面新型黄色微弧氧化陶瓷层的制备与表征
Preparation and Characterization of New Yellow Ceramic Coating by Micro Arc Oxidation on 6061 Aluminum Alloy

武上焜, 杨巍, 高羽, 苏霖深, 刘晓鹏, 陈建
WU Shang-kun, YANG Wei, GAO Yu, SU Lin-shen, LIU Xiao-peng, CHEN Jian

150 固体润滑剂 WS₂ 对铝合金微弧氧化陶瓷膜摩擦学性能的影响
Influence of Solid Lubricant WS₂ on the Tribological Properties of Micro-arc Oxidation Ceramic Coating of Al Alloy

付景国, 马圣林, 朱新河, 马春生, 徐长旗, 朱嘉琪
FU Jing-guo, MA Sheng-lin, ZHU Xin-he, MA Chun-sheng, XU Chang-qi, ZHU Jia-qi

158 氧化时间对 AZ31B 镁合金微弧氧化涂层结构及性能的影响
Effect of Oxidation Time on Structure and Properties of Micro-arc Oxidation Coating on AZ31B Magnesium Alloy

宁闯明, 崔学军, 王淋, 宋世杰, 张颖君
NING Chuang-ming, CUI Xue-jun, WANG Lin, SONG Shi-jie, ZHANG Ying-jun

专题——微生物腐蚀与防护

Special Topic—Microbiological Influenced Corrosion and Protection

166 海洋用金属材料的微生物腐蚀研究进展
Progress in Microbiologically Influenced Corrosion of Metallic Materials in Marine Environment

刘丹, 杨纯田, 周恩泽, 杨洪英, 李中, 徐大可, 王福会
LIU Dan, YANG Chun-tian, ZHOU En-ze, YANG Hong-ying, LI Zhong, XU Da-ke, WANG Fu-hui

175 卤氧化铋薄膜的制备及其在海洋防污应用中的进展
Progress in Preparation and Photocatalytic Marine Antifouling Application of Bismuth Oxyhalide Thin Film

杨治庆, 王毅, 张盾
YANG Zhi-qing, WANG Yi, ZHANG Dun

185 生物降解高分子基海洋防污材料的研究进展
Progress in Biodegradable Polymer-based Marine Antifouling Materials

潘健森, 谢庆宜, 马春风, 张广照
PAN Jian-sen, XIE Qing-yi, MA Chun-feng, ZHANG Guang-zhao

- 193 医用金属材料腐蚀疲劳性能研究进展
Research Progress on the Corrosion Fatigue of Biomedical Metallic Alloys
王强, 季洋, 徐大可
WANG Qiang, JI Yang, XU Da-ke
- 200 仿生微纳结构抗菌表面研究进展
Research Progress of Biomimetic Micro/Nano-structured Antibacterial Surfaces
裴阳阳, 宋青, 李鹏
PEI Yang-yang, SONG Qing, LI Peng
- 211 海洋中石油烃类降解与微生物腐蚀关系研究
Relationship between Hydrocarbon Degradation and Biocorrosion in Marine Environment
张一梦, 郑泽旭, 段继周
ZHANG Yi-meng, ZHENG Ze-xu, DUAN Ji-zhou
- 220 新型多功能季铵化抗菌材料的制备与应用
Preparation and Application of Novel Multifunctional Quaternary Ammonium Polymers Antibacterial Materials
曲彦儒, 张昊雷, 沈传凯, 崔东元, 丁小康
QU Yan-ru, ZHANG Hao-lei, SHEN Chuan-kai, CUI Dong-yuan, DING Xiao-kang
- 229 细菌黑色素在生物电化学领域的研究进展
Research Progress of Bacterial Melanin in Bioelectrochemistry
郭娜, 潘帅, 赵倩玉, 王亚楠, 郭章伟, 尹衍升, 董丽华, 刘涛
GUO Na, PAN Shuai, ZHAO Qian-yu, WANG Ya-nan,
GUO Zhang-wei, YIN Yan-sheng, DONG Li-hua, LIU Tao
- 237 基于表面引发聚合构建表面抗菌功能化牙科植入体
Functionalized Dental Implants with Antibacterial Surface Based on Surface Initiated Polymerization
孙玉洁, 章露娇, 赵玉清, 唐志辉, 段顺
SUN Yu-jie, ZHANG Lu-jiao, ZHAO Yu-qing, TANG Zhi-hui, DUAN Shun
- 247 DCOIT 复合 Zn-Ni 合金抗菌镀层的制备及其耐 SRB 腐蚀性能研究
Preparation of DCOIT Compositing Zn-Ni Alloy Antibacterial Coatings and Sulfate-reducing Bacterial Corrosion Resistance
翟晓凡, 管方, 王楠, 段继周, 侯保荣
ZHAI Xiao-fan, GUAN Fang, WANG Nan, DUAN Ji-zhou, HOU Bao-rong
- 256 大气环境中霉菌对氟碳彩涂板老化行为的影响
Effect of Mold on Aging Behavior of Fluorocarbon Colour Coated Sheet in Atmospheric Environment
马政, 卢琳, 刘倩倩, 张达威
MA Zheng, LU Lin, LIU Qian-qian, ZHANG Da-wei
- 263 土壤环境中管线钢硫酸盐还原菌腐蚀
Sulfate Reducing Bacteria Influenced Corrosion of Pipeline Steel in Soil
许进, 白云龙, 徐大可, 杜翠薇, 孙成
XU Jin, BAI Yun-long, XU Da-ke, DU Cui-wei, SUN Cheng
- 271 热带雨林环境中霉菌对 PCB-Cu 腐蚀行为的影响
Effect of Mold on the Corrosion Behavior of PCB-Cu in Tropical Forest Environment
白子恒, 李雪鸣, 胡玉婷, 王吉瑞, 卢琳, 董超芳, 肖葵
BAI Zi-heng, LI Xue-ming, HU Yu-ting, WANG Ji-rui, LU Lin, DONG Chao-fang, XIAO Kui
- 278 SLA 表面处理 TiCu 合金的抗菌性能研究
Antibacterial Performance of SLA Treated TiCu Alloy
刘蕊, 任玲, 杨柯
LIU Rui, REN Ling, YANG Ke
- 285 弹塑性应力作用下 X80 管线钢的菌致开裂行为
Bacteria Assisted Cracking of X80 Pipeline Steel under the Actions of Elastic and Plastic Stresses
吴堂清, 周昭芬, 王鑫铭, 张德闯, 闫茂成, 许进, 孙成, 尹付成
WU Tang-qing, ZHOU Zhao-fen, WANG Xin-ming, ZHANG De-chuang,
YAN Mao-cheng, XU Jin, SUN Cheng, YIN Fu-cheng
- 296 SLM 含铜钴基合金的抗菌性能及细胞相容性的初步探索
Preliminary Exploration on Antibacterial Property and Biocompatibility of SLM Copper-Cobalt Alloys
徐晶, 刘蕊, 曲冠霖, 王强, 任玲, 张扬
XU Jing, LIU Rui, QU Guan-lin, WANG Qiang, REN ling, ZHANG Yang

302 海洋环境中假单胞菌对聚氨酯清漆涂层分解的影响
Influence of *Pseudomonas* sp. on Degradation of Polyurethane Varnish Coating in Marine Environment
张伟雄, 吴进怡, 闫小宇, 柴柯
ZHANG Wei-xiong, WU Jin-yi, YAN Xiao-yu, CHAI Ke

309 一种简单有效的船体外加电流阴极保护设计方法
A Simple and Practical Method for ICCP Design of Ship
刘英伟, 周子杰, 张洋
LIU Ying-wei, ZHOU Zi-jie, ZHANG Yang

316 银、铜复合添加对 2205 双相不锈钢耐硫酸盐还原菌腐蚀行为的影响
Effect of Cu and Ag on Microbiologically Influenced Corrosion Resistance of 2205 Duplex Stainless Steel in Sulfate Reducing Bacteria
尹路, 徐大可, 杨春光, 席通, 李中, 赵颖, 杨柯
YIN Lu, XU Da-ke, YANG Chun-guang, XI Tong, LI Zhong, ZHAO Ying, YANG Ke

324 3D 打印含铜钴基合金与 PDLF 细胞生物相容性初探
Biocompatibility between Cu-bearing CoCrW Alloy by 3D Printing and PDLF
朱伟尧, 刘蕊, 战德松, 任玲, 王强
ZHU Wei-yao, LIU Rui, ZHAN De-song, REN Ling, WANG Qiang

表面强化及功能化 Surface Strengthening and Functionalization

332 材料表面微纳形貌对血管细胞行为影响的研究综述
Review on Influence of Micro-nano Scale Surface Topography on Vascular Cells Responses
李昱彤, 裴佳, 袁广银
LI Yu-tong, PEI Jia, YUAN Guang-yin

340 悬浮液等离子喷涂制备 FHA/CS 复合涂层
Fabrication of Fluoridated Hydroxyapatite-Calcium Silicate Coatings by Suspension Plasma Spray
周生健, 白玉, 迟柏祥, 尹雪, 马文
ZHOU Sheng-jian, BAI Yu, CHI Bai-xiang, YIN Xue, MA Wen

347 ZnO 掺杂对 ZnSb 相变薄膜结构和电学特性的影响
Effect of doping ZnO on the Structure and Electrical Characteristics of ZnSb Phase Change Film
吴德振, 周细应, 邱小小, 郝艳, 刘银杰
WU De-zhen, ZHOU Xi-ying, QIU Xiao-xiao, HAO Yan, LIU Yin-jie

表面摩擦磨损与润滑 Surface Friction Wear and Lubrication

353 导电耐磨自润滑涂层的研究现状与展望
Progress and Prospect in the Development of Conductive Wear Resistant and Self-lubricating Coatings
奚恒恒, 何鹏飞, 刘世贵, 马国政, 王海斗, 吕振林
XI Heng-heng, HE Peng-fei, LIU Shi-gui, MA Guo-zheng, WANG Hai-dou, LYU Zhen-lin

364 基于粘着特性的刀具磨损机理研究
Tool Wear Mechanism Based on Adhesion Characteristics
左俊彦, 林有希, 何明
ZUO Jun-yan, LIN You-xi, HE Ming

371 微喷砂处理对 TiN/MT-TiCN/Al₂O₃/TiOCN 多层涂层摩擦磨损性能的影响
Effect of Micro-blasting Post-treatment on the Friction and Wear Properties of TiN/MT-TiCN/Al₂O₃/TiOCN Multilayer Coatings
刘庆露, 朱丽慧, 刘振宇
LIU Qing-lu, ZHU Li-hui, LIU Zhen-yu