

目次 CONTENTS

表面强化及功能化 Surface Strengthening and Functionalization

1 弧光离子源耦合轴向磁场等离子体渗氮处理奥氏体不锈钢

Plasma Nitriding Treatment of Austenite Stainless Steel by Arc Ion Source Coupled with Axial Magnetic Field

刘兴龙, 赵彦辉, 蔺增, 史文博, 巴德纯, 于宝海, V. E. Ovcharenko
LIU Xing-long, ZHAO Yan-hui, LIN Zeng, SHI Wen-bo,
BA De-chun, YU Bao-hai, V. E. Ovcharenko

9 低碳钢气体氮碳共渗及后续淬火研究

Gaseous Nitrocarburizing and Post-quenching of Low Carbon Steel

李楠, 洪悦, 伍翠兰, 徐强

LI Nan, HONG Yue, WU Cui-lan, XU Qiang

17 微观结构与降解温度对掺硼金刚石薄膜电极电氧化降解活性橙 X-GN 染料废水的影响

Effects of Microstructure and Degradation Temperature on Electrochemical Oxidation Degradation of Reactive Orange X-GN Dye Wastewater by Boron Doped Diamond

胡靖源, 马莉, 朱成武, 梅瑞琼, 李伟, 周科朝, 余志明, 魏秋平
HU Jing-yuan, MA Li, ZHU Cheng-wu, MEI Rui-qiong,
LI Wei, ZHOU Ke-chao, YU Zhi-ming, WEI Qiu-ping

26 碳纳米管和镍共修饰 BDD 电极及其在非酶葡萄糖电化学传感器中的应用

Carbon Nanotubes and Nickel Co-modified BDD Electrodes and Their Application for Non-enzymatic Glucose Electrochemical Sensor

赵婷, 郑匡治, 郑棋文, 魏秋平, 马莉, 余志明, 周科朝
ZHAO Ting, ZHENG Kuang-zhi, ZHENG Qi-wen,
WEI Qiu-ping, MA Li, YU Zhi-ming, ZHOU Ke-chao

34 超疏水表面微结构的设计及其注射成型

Design and Injection Molding of Superhydrophobic Micro-structured Surface

赖俊, 翁灿, 王飞, 杨冬娇

LAI Jun, WENG Can, WANG Fei, YANG Dong-jiao

41 铝合金喷丸应力-变形的仿真分析与实验

Simulation Analysis and Experiment of Surface Stress-Deformation on Al-based Alloy by Shot Peening

陈家伟, 廖凯, 车兴飞, 钟利萍, 龚海

CHEN Jia-wei, LIAO Kai, CHE Xing-fei, ZHONG Li-ping, GONG Hai

48 H13 热冲压模具无化合物层抗冲击抗热疲劳离子渗氮技术研究与应用

Study and Application of Non-compound Layer Plasma Nitriding with Impact and Thermal Fatigue Resistance for H13 Hot Stamping Die Steel

唐磊, 陈尧, 彭甜甜, 李冬, 顾晓明, 胡静

TANG Lei, CHEN Yao, PENG Tian-tian, LI Dong, GU Xiao-ming, HU Jing

54 爆炸加载下 AISI304 不锈钢板表面硬化和数值模拟

Surface Hardening and Numerical Simulation on AISI304 Stainless Steel Plates by Explosive Impact Treatment

王呼和, 史志铭, 佟铮

WANG Hu-he, SHI Zhi-ming, TONG Zheng

60 TiO₂/CNTs 复合粒子的制备及其对高氯酸铵热分解性能的影响

Preparation of TiO₂/CNTs Composite Particles and Their Influence on Catalytic Property of Ammonium Perchlorate

孟胜皓, 杜仕国, 鲁彦玲, 王建华

MENG Sheng-hao, DU Shi-guo, LU Yan-ling, WANG Jian-hua

- 66 含氟低表面能修饰的超双疏涂层制备及其性能
Preparation and Properties of Fluorinated Low Surface Energy Modified Superamphiphobic Coatings
王静, 孔庆刚, 张龙, 钱海燕
WANG Jing, KONG Qing-gang, ZHANG Long, QIAN Hai-yan
- 73 SiO₂ 空心球闭孔减反膜的制备及性能研究
Preparation and Properties of Hollow Silica Close Pores Antireflection Coatings
段婷婷, 牛玉超, 高英, 杜勇, 姜言森, 任现坤
DUAN Ting-ting, NIU Yu-chao, GAO Ying, DU Yong, JIANG Yan-sen, REN Xian-kun
- 80 激光冲击与喷丸复合强化 TC17 钛合金表层残余应力研究
Residual Stresses of Compound Strengthening Case on TC17 Titanium Alloy by Laser Peening and Shot Peening
曹子文, 张杰, 车志刚, 邹世坤
CAO Zi-wen, ZHANG Jie, CHE Zhi-gang, ZOU Shi-kun

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

- 85 激光离散淬火对球墨铸铁磨损与损伤性能的影响
Effect of Laser Dispersed Quenching on Wear and Damage Property of Ductile Iron
苏超然, 吕长乐, 师陆冰, 张勇强, 王文健, 刘启跃
SU Chao-ran, LYU Chang-le, SHI Lu-bing, ZHANG Yong-qiang, WANG Wen-jian, LIU Qi-yue
- 91 阶梯槽织构对水润滑止推轴承静态特性的影响
Effect of Stepped-Groove Texture on the Static Performances of Water-lubricated Thrust Bearings
冯慧慧, 蒋书运, 姬翠翠
FENG Hui-hui, JIANG Shu-yun, JI Cui-cui
- 97 医用 NiTi 合金在 Hank's 模拟体液中的微磨损行为
Micro-wear Behavior of the Medical NiTi Alloy in Hank's Simulated Body Fluid
薛燕, 王振国
XUE Yan, WANG Zhen-guo
- 102 超疏水结构对 AZ91D 镁合金微摩擦磨损性能的影响
Effect of Superhydrophobic Structure on Microfriction and Wear Properties of AZ91D Magnesium Alloy
张倩倩, 漆雪莲, 张会臣
ZHANG Qian-qian, QI Xue-lian, ZHANG Hui-chen
- 109 刀具表面织构对刀-屑界面摩擦学特性的影响
Tribological Effect of Tool Surface Texturing on Tool-Chip Interface
逢明华, 聂永芳, 申福猴, 马利杰
PANG Ming-hua, NIE Yong-fang, SHEN Fu-hou, MA Li-jie
- 119 不同表面技术对挺柱组织及耐磨性的影响
Effect of Different Surface Treatment on Tappet Microstructure and Wear Resistance
程祥军, 黄国龙, 刘军, 魏涛, 张吉贤
CHENG Xiang-jun, HUANG Guo-long, LIU Jun, WEI Tao, ZHANG Ji-xian

表面失效及防护 Surface Failure and Protection

- 126 不同热处理态的 304 和 321 奥氏体不锈钢在氯化铵环境中的应力腐蚀行为对比研究
Comparative Study on Stress Corrosion Cracking Behaviors of 304 and 321 Austenitic Stainless Steels by Different Heat Treatment in NH₄Cl Solution
马宏驰, 吴伟, 周霄骋, 王亮
MA Hong-chi, WU Wei, ZHOU Xiao-cheng, WANG Liang
- 134 南海东部某油田隔水导管腐蚀失效分析
Corrosion Failure Analysis of Conductor in Eastern Oilfield in the South China Sea
殷启帅, 杨进, 施山山, 卢岩, 孙挺, 李振坤, 王俊翔, 杨育铭
YIN Qi-shuai, YANG Jin, SHI Shan-shan, LU Yan, SUN Ting, LI Zhen-kun, WANG Jun-xiang, YANG Yu-ming
- 142 交流杂散电流对 X70 管线钢 3PE 防腐层下腐蚀及剥离行为的影响
Effect of AC Stray Current on Corrosion and Stripping Behavior of X70 Pipeline Steel under 3PE Coating
王新华, 王祖全, 陈迎春, 宋旭婷, 徐成
WANG Xin-hua, WANG Zu-quan, CHEN Ying-chun, SONG Xu-ting, XU Cheng

- 151 考虑塑性的钢轨表面疲劳微裂纹分析
Analysis of Fatigue Micro-crack on Rail Surface under Plasticity
咎晓东, 王强胜, 生月, 江晓禹
ZAN Xiao-dong, WANG Qiang-sheng, SHENG Yue, JIANG Xiao-yu
- 157 GH80A 经强流脉冲电子束改性后的高温氧化行为研究
High Temperature Oxidation Behavior of Nickel-based Superalloy GH80A Treated by High-current Pulsed Electron Beam
刘迪, 高潘, 蔡杰, 张凌燕, 吕鹏, 关庆丰
LIU Di, GAO Pan, CAI Jie, ZHANG Ling-yan, LYU Peng, GUAN Qing-feng
- 166 含硫代硫酸根铝酸钠溶液中时间对 Q345 钢腐蚀的影响
Effect of Time on the Corrosion of Q345 Steel in Thiosulfate Sodium Aluminate Solution
付慧, 陈朝轶, 李军旗, 兰苑培, 张湘黔, 苑京久
FU Hui, CHEN Chao-yi, LI Jun-qi, LAN Yuan-pei, ZHANG Xiang-qian, YUAN Jing-jiu
- 173 基于 KPCA-BAS-GRNN 的埋地管道外腐蚀速率预测
Prediction of External Corrosion Rate of Buried Pipeline Based on KPCA-BAS-GRNN
骆正山, 姚梦月, 骆济豪, 王小完
LUO Zheng-shan, YAO Meng-yue, LUO Ji-hao, WANG Xiao-wan
- 181 SA-210C 和 15CrMoG 在给水加氧处理工况下的氧化特性研究
Oxidation Characteristics of SA-210C and 15CrMoG under Oxygenation Treatment Condition
查方林, 刘凯, 杨漫兮, 袁新民, 王凌
ZHA Fang-lin, LIU Kai, YANG Man-xi, YUAN Xin-min, WANG ling
- 189 壳聚糖对钛锆转化膜组织结构及耐蚀性的影响
Effect of Chitosan on Microstructure and Corrosion Resistance of Ti-Zr-based Conversion Coating
陈文, 苏文男, 李欣琳, 崔秀芳, 谢恩雨, 王一丹, 金国
CHEN Wen, SU Wen-nan, LI Xin-lin, CUI Xiu-fang, XIE En-yu, WANG Yi-dan, JIN Guo

膜层材料与技术 Coating Material and Technology

- 195 单晶金刚石外延层生长工艺研究
Growth Technology of Epitaxial Single Crystal Diamond Layer
安康, 刘金龙, 林亮珍, 张博弈, 赵云, 郭彦召, Tomasz Ochalski, 陈良贤, 魏俊俊, 李成明
AN Kang, LIU Jin-long, LIN Liang-zhen, ZHANG Bo-yi, ZHAO Yun, GUO Yan-zhao, Tomasz Ochalski, CHEN Liang-xian, WEI Jun-jun, LI Cheng-ming
- 202 甲烷与氢气的流量比在高功率下对金刚石膜生长的影响
Influence of the Gas Flow Ratio between CH₄ and H₂ on the Growth of Diamond Films at High Microwave Power
翁俊, 周程, 刘繁, 汪建华
WENG Jun, ZHOU Cheng, LIU Fan, WANG Jian-hua
- 210 N₂ 流量比对复合磁控溅射 Zr-B-N 薄膜结构和性能的影响
Influence of Nitrogen Flow on Structure and Performance of the Zr-B-N Films Prepared by Hybrid Magnetron Sputtering Techniques
王铁钢, 郭玉焱, 唐宽瑜, 刘艳梅, 林伟, 姜肃猛
WANG Tie-gang, GUO Yu-yao, TANG Kuan-yu, LIU Yan-mei, LIN Wei, JIANG Su-meng
- 218 原位合成 AlN-Fe₃Al 增强铁基等离子熔覆层结构及性能
Structure and Properties of In Situ Synthesized AlN-Fe₃Al Reinforced Fe-base Plasma Cladding Coating
唐明奇, 李刚, 冯在强, 王文, 闫镇威, 上官林建, 张瑞珠
TANG Ming-qi, LI Gang, FENG Zai-qiang, WANG Wen, YAN Zhen-wei, SHANGGUAN Lin-jian, ZHANG Rui-zhu
- 225 曲面光斑面积变化模型及其对熔覆质量的影响
Surface Facula Area Changing Model and Its Effect on Quality of Laser Cladding
崔权维, 孙文磊, 黄勇
CUI Quan-wei, SUN Wen-lei, HUANG Yong
- 233 硫酸根对甲基磺酸体系镀锡液性能的影响
Effect of Sulfate on Performance of Tin-plating Solution of Methanesulfonic Acid System
黎德育, 李曜, 沈鹏杰, 王振文, 王熙禹, 孔德龙, 李宁, WU Gang
LI De-yu, LI Yao, SHEN Peng-jie, WANG Zhen-wen, WANG Xi-yu, KONG De-long, LI Ning, WU Gang

- 239 高速赫尔槽在高速镀锡液中的应用
Application of Hull Cell for High-speed Tin Plating Solution
黎德育, 赵子微, 孔德龙, 李宁, WU Gang
LI De-yu, ZHAO Zi-wei, KONG De-long, LI Ning, WU Gang
- 245 ChCl-EG 低共熔溶剂体系中镍沉积的电化学行为研究
Electrochemical Behavior of Nickel Electroplating Process in ChCl-EG Eutectic Solvents
谭勇, 张久凌, 孙杰
TAN Yong, ZHANG Jiu-ling, SUN Jie

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

- 251 主轴式滚磨光整加工中介质流场的数值模拟及作用机理分析
Analysis on Numerical Simulation and Mechanism of Medium Flow Field in Spindle Barrel Finishing Process
王程伟, 李秀红, 李文辉, 王娜, 杨胜强
WANG Cheng-wei, LI Xiu-hong, LI Wen-hui, WANG Na, YANG Sheng-qiang
- 259 磁粒复合研磨 SUS304 不锈钢孔道的机理与试验研究
Mechanism and Experimental Study of SUS304 Stainless Steel Hole by Magnetic Particle Compound Grinding
张龙龙, 焦安源, 陈燕, 韩冰
ZHANG Long-long, JIAO An-yuan, CHEN Yan, HAN Bing
- 267 石英玻璃管内表面的复合光整试验研究
Experimental Study of Composite Finishing on the Inner Surface of Quartz Glass Tube
刘顺, 韩冰, 马学冬, 陈永君, 解志文, 许召宽, 陈燕
LIU Shun, HAN Bing, MA Xue-dong, CHEN Yong-jun, XIE Zhi-wen, XU Zhao-kuan, CHEN Yan
- 274 旋转超声辅助磁力研磨镍基合金参数优化设计及分析
Optimization Design and Analysis of Ni Based Alloy by Rotating Ultrasonic Assisted Magnetic Abrasive Finishing
曾加恒, 陈燕, 张科丙, 刘新龙, 陈宇辉
ZENG Jia-heng, CHEN Yan, ZHANG Ke-bing, LIU Xin-long, CHEN Yu-hui
- 281 低频交变磁场超精密平面磁力研磨加工研究
Ultra-precision Surface Magnetic Grinding by Low Frequency Alternating Magnetic Field
吴金忠, 邢百军, 邹艳华, 郑菲
WU Jin-zhong, XING Bai-jun, ZOU Yan-hua, ZHENG Fei
- 290 基于灰度均衡模型联合 Gabor 滤波器的钢轨表面缺陷检测方法
Research on Rail Surface Defect Detection Method Based on Gray Equalization Model Combined with Gabor Filter
刘琴琴, 周慧云, 王兴洲
LIU Qin-qin, ZHOU Hui-yun, WANG Xing-zhou
- 295 砂带磨削表面粗糙度理论预测及灵敏度分析
Theoretical Prediction and Sensitivity Analysis of Surface Roughness of Abrasive Belt Grinding
高超, 王生, 王会, 刘广照, 吴国荣
GAO Chao, WANG Sheng, WANG Hui, LIU Guang-zhao, WU Guo-rong