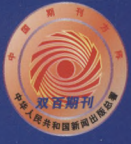


全国中文核心期刊

Rejiagong Gongyi

ISSN1001-3814
CN61-1133/TG
CODEN: REHOEL



热加工工艺

HOT WORKING TECHNOLOGY

22

2016
第45卷
(总第452期)

<http://www.rjggy.net>

邮发代号: 52-94



这一次，我们 **重新定义** 了智能温度控制器



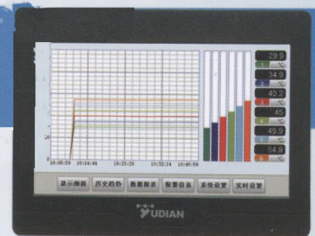
 厚度 38mm	 模块化技术	 全中文操作	 数据存储可达 12年	 全新PID算法
--	--	--	---	--

AI-3700/3900系列 人工智能温度控制器/工业调节器

38mm 厚度机身内置 5 个模块插座，客户可自行安装各种模拟量和开关量的输入、输出模块来灵活配置仪表的功能。



登陆宇电官网 <http://www.yudian.com> 了解更多详情。



400-880-9029

宇电自动化科技有限公司
XIAMEN YUDIAN AUTOMATION TECHNOLOGY CO.,LTD.



关注有惊喜

中国船舶重工集团公司第十二研究所 合办
中国造船工程学会船舶材料学术委员会

名师荐稿

- 激光 3D 打印用 TC21 钛合金粉末制备及其成形性研究 王 栋, 陈岁元, 魏明炜, 等 (1)

综述

- 焊接熔池图像视觉传感技术的研究现状及发展趋势 闻倩艺, 何建萍, 王昂洋 (7)
- 固体氧化物燃料电池合金连接体尖晶石保护涂层研究进展 柴杭杭, 支龙, 张勇, 等 (11)
- 磁控溅射制备 IGZO 薄膜材料技术的研究进展 张力, 杨钊, 郝雨林, 等 (16)
- 激光熔覆制备高熵合金涂层的研究进展 李相阳, 朱红梅 (19)
- 铜铝复合材料在电力电气行业的研究和应用 夏兆辉, 姚辉, 孙谊嫔, 等 (24)
- 石墨烯及其增强轻金属基复合材料的研究现状 朱卫华, 范玉虎, 申世坤, 等 (29)
- 纳米颗粒增强铝基复合材料的研究进展 潘利文, 唐景凡, 林维捐, 等 (33)
- 热喷涂制备 Fe 基非晶态合金涂层研究进展 姜超平, 王军兴, 张晓琳 (38)
- 铝碳复合材料的研究进展 姚辉, 廖晶, 崔晓东, 等 (43)

金属材料

- 二冷区温度波动下含 Nb-Ti 微合金钢热塑性行为研究 唐国章, 曾亚南, 李俊国 (47)
- Q345 钢的高温氧化动力学研究 王红国, 马世博, 张双杰, 等 (52)
- 喷雾造粒粉末对粉末冶金 316L 不锈钢组织及力学性能的影响 罗浩, 潘超梅, 崔增菊, 等 (56)
- 表面粗糙度对动车组车轴钢弯曲疲劳性能的影响 陈煜达, 赵秀娟, 潘金芝, 等 (60)
- 引线框架用 Cu-Sn-Ni-P 合金抗软化性能的研究 刘峰, 李正方, 彭丽军, 等 (63)
- 建筑用耐火钢的开发与性能研究 杨卫芳 (67)
- 机械传动轴用新型材料的组织与性能研究 涂春莲 (70)
- 层片状结构超细晶镍的腐蚀行为 张传鑫, 李娟, 武晓雷, 等 (73)
- 退役泵车臂架高强钢的疲劳性能研究 太平, 黄江华, 毛为乙, 等 (76)
- Ti₃Al 合金的高温氧化行为 高洋洋, 王文波, 王红利, 等 (79)
- 电参数对 20Mn23AlV 无磁钢毛化形貌影响的研究 杨洋, 徐俊杰, 仇文亮, 等 (82)
- 硅对热轧低碳贝氏体钢组织和力学性能的影响 袁清, 徐光, 何贝, 等 (85)
- V-Ti 复合微合金化 N80 非调质油管钢碳氮化物析出热力学研究 李景翠, 万继方, 郝强升, 等 (88)
- 25CrMnSi 钢在不同水砂比砂浆中的三体磨料磨损性能 景浩, 崔博, 吕振林 (92)
- Er 微合金化对工业纯铝铸态组织的影响 刘杰, 叶茂, 王淑青, 等 (95)
- G105 钻杆钢在 H₂S 溶液中的应力腐蚀开裂行为 郑新侠 (97)
- 铜含量对铝基烧结合油轴承性能的影响 宋羽, 张修庆, 陆钦鑫, 等 (101)
- Be-38Al 合金组织的改性研究 王晶, 周运洪, 龙波, 等 (105)
- 影响钛合金屈强比的因素及作用机理探讨 王海, 魏芬绒, 邓家彬, 等 (109)
- 基于蠕变损伤开裂和扩展的高压导汽管寿命评估 马东方, 蔡红生, 魏泉泉, 等 (112)

复合材料

- Te 变质处理对原位自生 Mg₂Si/AZ91D 复合材料的影响 陈淑英, 陈智麟, 邵秉川, 等 (116)
- 炭黑 / 铜粉对导电硅橡胶电性能的影响 卢军, 焦鹏飞, 朱增福 (120)
- 固相扩散反应制备 TiC 致密陶瓷层增强灰铸铁基表面复合材料 樊少忠, 钟黎声, 付永红 (123)
- 搅拌时间对 Al-Fe-Si/Al 原位复合材料的影响 姜美, 江其阳, 熊光耀, 等 (127)

Al₂O₃ 粒径对铝基复合材料拉伸性能和断裂机制的影响 邵静波, 陈刚, 史经浩, 等 (132)
时效处理对汽车用镁基复合材料显微结构和性能的影响 段亚丽 (135)

表面改性技术

高强 IF 钢合金化镀锌板表面组织及镀层铁含量对耐蚀性的影响 程东妹, 陈斌锴, 俞钢强 (138)
WC-CoCr 涂层热震及高温抗氧化性能 陈江涛, 孙万昌, 张磊, 等 (141)
体育器械用镁合金的表面改性与性能研究 郭亚举 (145)
喷丸处理对热障涂层组织与性能的影响 宋闪光, 王伟, 谭世磊, 等 (149)
TC11 合金多道激光熔覆温度场及涂层性能研究 赵树国, 李成龙 (152)

热处理技术

退火对 5052 铝合金搅拌摩擦加工性能的影响 赵金国, 夏祥春, 吴松林 (156)
盘形滚刀刀圈热处理工艺及其性能预测 夏毅敏, 张睿, 丛国强, 等 (160)
热处理工艺对超导阻隔层用钽板力学性能的影响 董璞, 胡淑娟, 屈红星, 等 (163)
含 Ti 高强建筑结构钢 HG785 轧制中的动态再结晶行为研究 杨晓勇 (165)
基于 BP 神经网络算法的耐磨钢热处理工艺优化 路泽永 (168)
退火温度对硬质合金刀具材料耐磨性能的影响 李家伟 (172)
基于 BP 神经网络的蒸汽发生器用镍基合金热处理工艺的优化 何小英 (175)
超高强度工程结构用钢的热处理工艺优化 刘艳宾 (179)
热处理对汽车用铝合金组织和性能的影响 郝刚 (183)
深冷处理对高速钢刀具组织和力学性能的影响 李建国 (186)
退火工艺对电铸铜组织和组织的影响 刘双新, 贾涓, 柳德超 (190)
退火工艺对 SUS410L 不锈钢热轧板组织与力学性能的影响 徐斌, 李具仓, 钱张信, 等 (194)
热处理对建筑高强度耐热钢力学性能的影响 李伟 (197)
中温时效对 2205 双相不锈钢析出相及晶间腐蚀性能的影响 王成军, 何亮, 方陆恒, 等 (200)
锻态 QA19-4 铝青铜热处理工艺研究 张琳, 汪建敏, 储文平等 (203)
石墨烯改性模具材料的热处理工艺研究 周登攀 (207)
回火温度对 960MPa 级工程机械用钢组织与力学性能的影响 赵燕青, 张朋, 刘宏强, 等 (211)
核电站用国产铸造双相不锈钢的热老化 刘同华, 王伟, 强文江 (214)
热处理对高强建筑钢组织和性能的影响 王永先, 马军霞 (217)
N6 纯镍板材冷轧后退火工艺的探索 王丁, 史庆南, 曹占元, 等 (220)
热处理工艺对汽车座椅用铝合金力学性能的影响 高国天 (223)
WB36CN1 钢管件热处理工艺的正交优化 盛慧, 余志勇 (227)
基于计算机模拟法兰盘激光热处理的相变分析 王丹萍 (230)
回火温度对汽车悬架 Si-Cr 弹簧钢微观组织和力学性能的影响 向巍 (233)
局部热处理对新型冷作模具钢组织与性能的影响 刘睿, 刘晶 (235)
断续时效工艺对 7055 铝合金组织和性能的影响 李媛媛, 刘纪新, 朱青青, 等 (239)
65Mn 钢波形弹簧的热处理工艺研究 刘春燕, 吉卫, 李敬民, 等 (242)
基于激光共聚焦技术对 16MnR 钢高温损伤后疲劳断裂的分形研究 刘安中, 王涛, 雷声, 等 (245)
热处理对 P92 钢管件硬度的影响 安威, 赵强, 丛相州, 等 (249)
退火温度对新型建筑钢结构材料性能的影响研究 邓治华 (253)

失效分析

DP600 双相钢高温塑性失效研究 邹贻川, 李会, 吴润, 等 (256)
发动机气门弹簧断裂分析与预防 白云岭 (260)

读者若发现本刊有印刷、装订质量问题, 请寄回编辑部调换。

Famous Teacher Recommendation

Study on Preparation and Formability of TC21 Titanium Alloy Powder for Laser 3D Printing (1)

Review

Research Status and Development Trend of Visual Image Sensor Technology for Welding Pool (7)
Research Progress of Spinel Protective Coatings on Alloy Interconnects for Solid Oxide Fuel Cells (11)
Research Progress of IGZO Film Material Technology Prepared by Magnetron Sputtering Method (16)
Research Progress of High Entropy Alloy Coating Prepared by Laser Cladding (19)
Research and Application of Copper-aluminum Composite in Electric Power Industry (24)
Research Status of Graphene and Its Reinforced Light Metal Matrix Composite (29)
Research Development of Nano-particles Reinforced Aluminum Matrix Composite (33)
Research Progress of Fe Matrix Amorphous Coating Prepared by Thermal Spraying (38)
Research Progress of Al/C Composite (43)

Metal Material

Research on Hot Ductility Behavior of Nb-Ti Microalloyed Steel with Temperature Fluctuation
in Secondary Cooling Zone (47)
Study on High Temperature Oxidation Kinetics of Q345 Steel (52)
Effect of Spray Granulation Powder on Microstructure and Properties of 316L Stainless Steel Prepared
by Powder Metallurgy (56)
Effects of Surface Roughness on Bending Fatigue Properties of Motor Train Unit Axle Steel (60)
Study on Softening Resistance Performance of Cu-Sn-Ni-P Alloy for Lead Frame (63)
Development of Refractory Steel and Properties Research (67)
Research on Microstructure and Properties of New Material for Mechanical Transmission Shaft (70)
Corrosion Behavior of Lamellar UFG Nickel (73)
Fatigue Performance Research of High-Strength Steel Used in Retired Concrete Pump Truck's Boom (76)
Research on Oxidation Behavior of Ti₃Al Alloys at High Temperatures (79)
Study on Influence of Electrical Parameters on Texturing Morphology of 20Mn23AlV Non-magnetic Steel (82)
Effect of Si Content on Microstructure and Mechanical Properties of Hot Rolled Low Carbon Bainite Steel (85)
Research on Thermodynamics of Carbonitride Precipitation Behavior of V-Ti Composite
Micro-alloying N80 Non Q&T Casing Steel (88)
Three-body Abrasive Wear Properties of 25CrMnSi Steel in Slurry with Different Ratio of Water and Sand (92)
Effect of Er Micro-alloying on As-cast Structure of Industrial Pure Aluminum Alloy (95)
Stress Corrosion Cracking Behavior of G105 Drill Pipe Steel in H₂S Solution (97)
Effect of Copper Content on Properties of Aluminum Based Sintered Oiled Bearing (101)
Study on Modification of Microstructure of Be-38Al Alloy (105)
Effect Factors for Yield Ratio of Titanium Alloy and Discussion of Function Mechanism (109)
Life Evaluation of High Pressure Pipe Based on Creep Damage Cracking and Extension (112)

Compound Material

Effects of Te Modification Treatment on In-situ Mg₂Si/AZ91D Composite (116)
Effect of Carbon Black/Copper Powder on Electrical Properties of Conductive Silicone Rubber (120)
Preparation of TiC Dense Ceramic Layer Reinforced Gray Cast Iron Matrix Surface
Composite by Solid Phase Diffusion (123)
Effect of Stirring Time on Al-Fe-Si/Al In-situ Composite (127)
Effects of Al₂O₃ Size on Tensile Properties and Fracture Mechanism of Al Matrix Composite (132)
Effect of Aging Treatment on Microstructure and Properties of Magnesium Matrix Composites for Automobile ... (135)

Surface Modification Technology

- Effects of Surface Microstructure and Fe Content in Coating on Corrosion Resistance of High Strength IF Galvannealed Sheet (138)
- Thermal Shock and High Temperature Oxidation Resistance Properties of WC-CoCr Coating (141)
- Research on Surface Modification and Properties of Magnesium Alloy for Sports Equipment (145)
- Effect of Shot Peening Treatment on Microstructure and Properties of Thermal Barrier Coating (149)
- Research on Temperature Field and Coating Performance of Multi-track Laser Cladding on TC11 Alloy (152)

Heat Treatment Technology

- Influence of Annealing on Friction Stir Processing Properties of 5052 Aluminum Alloy (156)
- Heat Treatment Process and Performance Prediction of Disc Cutter Ring (160)
- Effect of Heat Treatment Process on Mechanical Properties of Niobium Plate for Superconducting Barrier Layer (163)
- Study on Dynamic Recrystallization Behavior of HG785 High Strength Structural Steel Containing Ti in Rolling (165)
- Heat Treatment Process Optimization of Wear Resistant Steel Based on BP Neural Network Algorithm (168)
- Effect of Annealing Temperature on Wear Resistance of Cemented Carbide Tool Materials (172)
- Heat Treatment Process Optimization of Nickel-based Alloy for Steam Generator Based on BP Neural Network (175)
- Optimization of Heat Treatment Process of Super High Strength Steel for Engineering Structure (179)
- Effect of Heat Treatment on Microstructure and Properties of Al Alloy for Automobile (183)
- Effect of Cryogenic Treatment on Microstructure and Mechanical Properties of High Speed Steel Cutter (186)
- Effects of Annealing Process on Microstructure and Texture of Electroforming Copper (190)
- Effect of Annealing Process on Microstructure and Mechanical Properties of Hot-rolled SUS410L Stainless Steel Plate (194)
- Effect of Heat Treatment on Mechanical Properties of High Strength Refractory Steel for Building (197)
- Effect of Medium Temperature Aging on Precipitation Phase and Intergranular Corrosion Resistance of 2205 Duplex Stainless Steel (200)
- Study on Heat Treatment Technology of Forged QAl9-4 Aluminum Bronze (203)
- Research on Heat Treatment Process of Modified Die Materials with Graphene (207)
- Effects of Tempering Temperature on Microstructure and Mechanical Properties of 960 MPa Grade Steel for Engineering Machinery (211)
- Thermal Aging of Cast Duplex Stainless Steel Made in China for Nuclear Power Plant (214)
- Effect of Heat Treatment on Microstructure and Properties of High Strength Construction Steel (217)
- Exploration on Annealing Process of N6 Pure Nickel Sheet After Cold Rolling (220)
- Effect of Heat Treatment Process on Mechanical Properties of Aluminum Alloy for Automobile Seat (223)
- Orthogonal Optimization of Heat Treatment Process for WB36CN1 Steel Pipe Fitting (227)
- Phase Transformation Analysis of Laser Heat Treatment of Flange Plate Based on Computer Simulations (230)
- Effects of Tempering Temperature on Microstructure and Mechanical Properties of Automobile Suspension Si-Cr Spring Steel (233)
- Effects of Local Heat Treatment on Microstructure and Properties of New-typed Cold Working Die Steel (235)
- Influence of Intermittent Aging Process on Microstructure and Mechanical Properties of 7055 Aluminum Alloy (239)
- Improvement of Heat Treatment Process for 65Mn Steel Wave Spring (242)
- Fractal Research on 16MnR Steel Fatigue Fracture after High Temperature Damage Based on Laser Confocal Technology (245)
- Effects of Heat Treatment on Hardness of P92 Steel Pipe (249)
- Effect of Annealing Temperature on Properties of New-typed Construction Steel Structure Material (253)

Failure Analysis

- Research on Hot Ductility Failure Behavior of DP600 Duplex Steel (256)
- Fracture Analysis and Prevention of Engine Valve Spring (260)

南京摄山电炉总厂

——中国电炉行业的排头兵

敬请访问 www.chinafurnace.com



双门双台车式保护气氛电阻炉



大型井式气体渗碳炉

南京摄山电炉总厂是由多个分厂、研究所、热处理新技术、新设备开发中心组成的中国电炉行业的重点骨干企业，多年来经营业绩在电炉行业保持着排头兵的地位。主要生产计算机控制的多种热处理成套机组及高效节能、无污染的少(无)氧化炉和可控气氛炉，共有218个系列2188个品种，其中获国家级新产品一项，部优、省优多项。企业于1999年通过ISO9001质量体系认证。“摄山牌工业电炉”还被江苏省和南京市人民政府命名为“名牌产品”。

用户满意，是摄炉人的承诺；

一流品质，是摄炉人的职责！

地址：南京市栖霞区石埠桥工业园河东里88号

电话：(025)85712768 85764863 85761318

传真：(025)85761587 邮编：210033 联系人：吴越

研究所、市内经营部：南京市龙蟠路218号兴隆大厦805室

电话：(025)85540040

E-mail: info@chinafurnace.com