



目 次

综合论述

全奥氏体高锰钢在极低温环境的应用研究进展 .....  
..... 吴彦欣, 米振莉, 孙 超, 李 伟, 陈其源, 谢良稳, 王长军, 郭广飞 (743)

冶炼与加工

高炉喷吹煤种选择对混煤燃烧性及性价比的影响 .....  
..... 冯 伟, 马诗琦, 邢相栋, 任萌萌, 李 斌, 卫社彦, 阮 方 (763)

中小型转炉交错氧枪射流特性的优化设计研究 ..... 江天野, 王连钰, 王 奎, 杨 滨, 刘 坤, 刘晓明 (774)

转炉底吹气体搅拌强化熔池钢水元素传质速率研究 ..... 李 斌, 陈 利 (786)

含铝灰精炼渣熔化温度研究 ..... 翟敏莉, 臧喜民, 李世森, 杨 杰, 孔令种 (800)

钙含量对铝脱氧钢中夹杂物的影响研究 .....  
..... 朱浩然, 李建立, 朱航宇, 杨春华, 谢毓敏, 彭红兵, 宋明明 (811)

高强度钢丝拉拔过程损伤模拟研究 .....  
..... 田仁敏, 鲍思前, 康筱龙, 薛花娟, 朱晓雄, 李时进, 祖守胡, 孙芮均 (823)

材料研究

外加  $Al_2O_3$  和稀土对高铬铸铁组织与耐磨性的影响 .....  
..... 刘东祥, 肖志霞, 夏超群, 孙继兵, 刘宝奎, 方 伟, 丁 俭, 夏兴川 (834)

新型 960 MPa 级防爆钢强韧性及抗爆性能研究 ..... 葛 琛, 赵洪山, 郑 磊, 郭龙鑫, 董 瀚 (844)

Mn 元素合金化对 Al-0.11Cu-Mn 合金氢脆行为的影响 ..... 赵旭东, 赵显鹏, 乔岩欣, 杨浩坤 (852)

X80 管线钢环焊接头成分组织硬度分布高通量表征 .....  
..... 刘 丰, 杨丽霞, 张鹤松, 贾书君, 刘胜胆, 杨植岗 (859)

面向滚子表面缺陷的轻量化多视角智能分类模型 ..... 李 梁, 毕 利, 焦小刚 (871)

能源与环保

钢铁原燃料碳排放分析与降碳研究 ..... 杜彦荣, 王 倩, 梁传智, 谢荣圆, 苗海涛, 高 媛 (886)

信息 ..... (762, 785, 822, 870, 885, 900)

**CONTENTS**

**Review**

Research progress on application of fully austenitic high-manganese steel in extremely low-temperature environments .....  
*WU Yanxin, MI Zhenli, SUN Chao, LI Wei, CHEN Qiyuan, XIE Liangwen, WANG Changjun, GUO Guangfei (743)*

**Smelting and Working**

Influence of coal type selection for blast furnace injection on combustibility and cost-performance ratio of blended coals .....  
 ..... *FENG Wei, MA Shiqi, XING Xiangdong, REN Mengmeng, LI Bin, WEI Sheyan, RUAN Fang (763)*

Optimization design of jet characteristics for staggered oxygen lances in small and medium-sized converters .....  
 ..... *JIANG Tianye, WANG Lianyu, WANG Xi, YANG Bin, LIU Kun, LIU Xiaoming (774)*

Enhancement of mass transfer rate of elements in molten steel bath via bottom-blowing gas stirring in converter .....  
 ..... *LI Bin, CHEN Li (786)*

Melting temperature of refining slag containing aluminum ash .....  
 ..... *ZHAI Minli, ZANG Ximin, LI Shisen, YANG Jie, KONG Lingzhong (800)*

Effect of calcium content on inclusions in Al-killed steel .....  
 ..... *ZHU Haoran, LI Jianli, ZHU Hangyu, YANG Chunhua, XIE Yumin, PENG Hongbing, SONG Mingming (811)*

Simulation study on damage of high strength steel wire during drawing process .....  
*TIAN Renmin, BAO Siqian, KANG Xiaolong, XUE HuaJuan, ZHU Xiaoxiong, LI Shijin, ZU Shouhu, SUN Ruijun (823)*

**Materials Research**

Effects of externally added Al<sub>2</sub>O<sub>3</sub> and rare earth elements on microstructure and wear resistance of high-chromium cast iron .....  
*LIU Dongxiang, XIAO Zhixia, XIA Chaoqun, SUN Jibing, LIU Baoxi, FANG Wei, DING Jian, XIA Xingchuan (834)*

Strength and toughness of novel 960 MPa grade explosion-proof steel with blast resistance performance research .....  
 ..... *GE Chen, ZHAO Hongshan, ZHENG Lei, GUO Longxin, DONG Han (844)*

Effect of Mn alloying on hydrogen embrittlement in Al-0.11Cu-Mn alloys .....  
 ..... *ZHAO Xudong, ZHAO Xianpeng, QIAO Yanxin, YANG Haokun (852)*

High-throughput characterization of composition, microstructure and hardness distribution in X80 pipeline steel girth welded joints ...  
 ..... *LIU Feng, YANG Lixia, ZHANG Hesong, JIA Shujun, LIU Shengdan, YANG Zhigang (859)*

Lightweight multi-view intelligent classification model for roller surface defects ..... *LI Liang, BI Li, JIAO Xiaogang (871)*

**Energy and Environmental Protection**

Carbon emission analysis and carbon reduction research on raw fuels for iron and steel industry .....  
 ..... *DU Yanrong, WANG Qian, LIANG Chuanzhi, XIE Rongyuan, MIAO Haitao, GAO Yuan (886)*