

ISSN 1001-1250
CN 34-1055/TD
CODEN JIKUFY

金属矿山

JINSHU KUANGSHAN

METAL MINE



8

2021

(总第542期)

中国百强科技期刊 | 国家期刊奖百种重点期刊 | 中国期刊方阵双百期刊 | 中国精品科技期刊

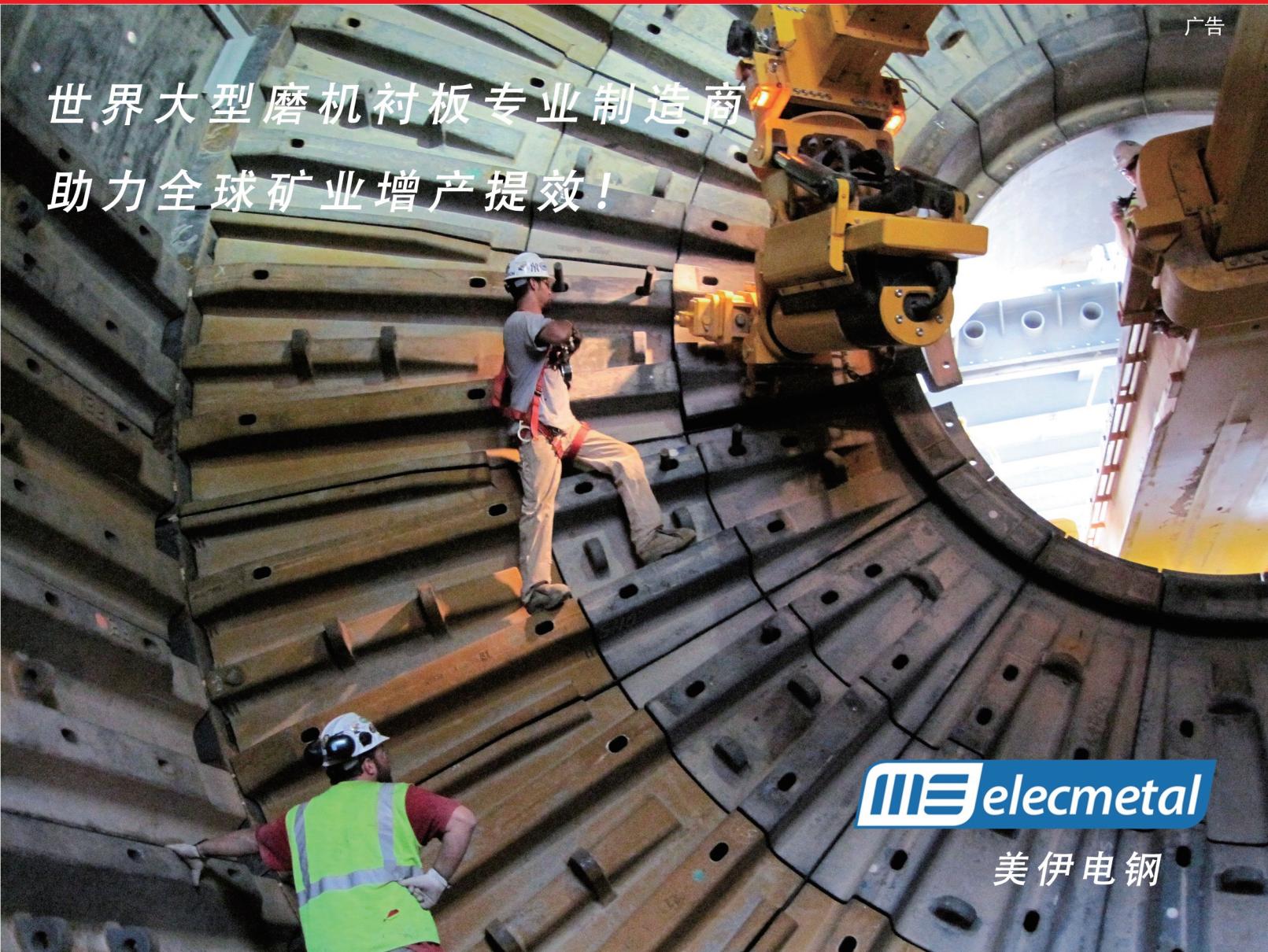
美国 CA、CSA 收录期刊 | 全国中文核心期刊 | 中国科技核心期刊 | 日本 JST 收录期刊

主办单位：中钢集团马鞍山矿山研究总院股份有限公司 中国金属学会 编辑出版：《金属矿山》编辑部

广告

世界大型磨机衬板专业制造商

助力全球矿业增产提效！



elecmetal

美伊电钢

百年铸造、百年品质
为全球矿山提供卓越的
耐磨件产品和服务

ISSN 1001-1250



0.8>

9 771001 125214

美伊电钢(常州)机械有限公司, 江苏省常州市新北区东港二路31号: 0519-68001000
ME Elecmetal, Chile, Av. Estacion 01200, Rancagua; 5672 2587600
ME Global, USA, 3901 University Av. N.E., Minneapolis, MN 55421; 1-763-7881651

万方数据

目 次

· 采矿工程 ·

张家洼铁矿崩落转充填采矿工艺及结构参数研究	赵增山 张 舟 金爱兵 毕 坤	(1)
冒落胶结充填体对崩落法矿石回收效果影响作用研究	谭宝会 陶发玉 朱 强 钟立鹏 张志贵 陈星明	(10)
矿用新型充填胶凝材料配比实验及其水化机理研究	何建元 尹升华 陈 卓 李 楠 高 谦	(18)
基于剪切应力变化量的全尾砂浆触变特性分析	甘德清 常英杰 张友志 闫泽鹏 杜双成	(24)
缓倾斜薄矿体开采空区群精确数字化及稳定性分析	代碧波 孙丽军 赵兴东	(30)
井工转露天采区顶板厚度不足诱发滑坡问题研究	孙世国 宋腾飞 刘维东 肖 剑	(35)
复杂破碎矿体试验采场稳定性分析及结构参数优化	李胜辉 王立杰 刘志义 王庆刚 卢宏建 耿 帅	(41)
基于三维重构技术的爆破活动对邻近巷道围岩损伤影响分析	俞祥杰 袁海平 熊礼军 陈 晨 张 羽	(46)
某地下金属矿直眼掏槽爆破试验及控制措施		汪 平 (52)
放矿扰动和矿体倾角对散体侧压力分布的影响研究	刘 洋 何荣兴 任凤玉 张东杰	(57)
冲击载荷下灰岩的动力学特性及能量耗散规律	李兵磊 远彦威 曹洋兵 张 遂 王武功	(61)
考虑高程与能量的爆破振动持时分析	包 松 郭连军 莫宏毅 徐振洋	(67)
基于PFC的矿石块度对溜井放矿效果的影响研究	李 贵 李志国 李国书 宋金凤 黄诗杰	(71)

· 矿物工程 ·

银离子对细菌浸出含砷铜矿中铜的影响	刘金艳 高 磊 刘志远 辛靖靖 伍赠玲	(76)
菱铁矿微波磁化焙烧试验研究	周廷波 严倩倩 陈睿哲 魏晓彤 张淑敏 孙永升	(82)
东鞍山铁矿石高效分选新技术研究	杨 光 马自飞 杨会利 袁立宾 孙永升	(88)
聚(4-苯乙烯磺酸-共聚-马来酸)钠盐在磷灰石浮选脱镁中的机理研究	关智文 杨丙桥 曾梦媛 罗惠华 邓 冰	(95)
矿物浮选矿浆相流变学研究进展	邹玉超 王 磊 李国胜	(102)
敦煌平台山石煤钒矿工艺矿物学研究	白 哲 韩跃新 靳建平 李艳军 孙永升	(109)
锡石选别工艺和药剂研究进展	张文杰 华中宝 谢 贤 陈禹蒙 曹 阳 童 雄 封东霞	(116)

· 地质与测量 ·

甘肃北山大旗山首例陆相火山一次火山热液型铅锌矿的发现：勘查地球化学找矿成功案例	丁书宏 叶红刚 魏万鸿	(122)
赣南青塘地区土壤沉积物地球化学特征及找矿方向	薛盈杉 袁慧香 贺根文	(131)
基于DS-InSAR的张双楼煤矿长时序地表形变监测方法	赵立峰 范洪冬 渠俊峰 李腾腾	(142)

· 机电与自动化 ·

井下电机车轨道障碍物图像处理方法的智能识别技术	于骞翔 张元生	(150)
非煤智慧矿山建设中5G技术应用前景	胡乃民	(158)

· 安全与环保 ·

基于机器学习的露天矿排土场边坡稳定性预测	秦驰越 张文兴	(164)
铁尾矿植被混凝土配制及其植物适宜性研究	宋建伟 刘 硕 袁运许 夏 冬 鲁明星	(170)
新疆某露天矿排土场土壤质量分级评价	孙雪亮 赵建港 余勤飞 李晓楠 李欣颖 张 凯	(178)
TiO ₂ @芽孢杆菌光催化性能研究	李官超 祝 瑶 滕 青 刘生玉 杨志超	(186)
固化剂对钒、铬复合污染土壤修复效果研究	董颖博 陈丹妮 林 海	(196)
巷道边壁支护方式下风流场流速分布特征的PIV实验研究	宋 莹 朱 萌 邓立军 王 东	(203)

· 综合利用 ·

利用焙烧铁尾矿制备透水砖的水化特征研究	南晓杰 王 帅 刘立伟 赵礼兵	(208)
黄金尾砂和煤矸石协同制备发泡陶瓷及其性能研究	孙晓刚 马征宇 赵家琪 闫雨辰 王玉斌 潘建达 邱景平	(214)

CONTENTS

Study on the Mining Technology and Structure Parameters of Zhangjiawa Iron Mine from Caving to Filling	ZHAO Zengshan ZHANG Zhou JIN Aibing BI Kun (1)
Study on the Effect of Caved Cemented Filling on the Ore Recovery of Sublevel Caving Mining Method	TAN Baohui TAO Fayu ZHU Qiang ZHONG Lipeng ZHANG Zhigui CHEN Xinming (10)
Study on the Mixing Ratio Experiment and Hydration Mechanism of New Filling Cementitious Materials for Mining	HE Jianyuan YIN Shenghua CHEN Zhuo LI Nan GAO Qian (18)
Analysis of Thixotropic Properties of Unclassified Tailing Slurry Based on Variation of Shear Stress	GAN Deqing CHANG Yingjie ZHANG Youzhi YAN Zepeng DU Shuangcheng (24)
Accurate Digitization and Stability Analysis of Cavity Group of Gently Inclined Thin Orebody	DAI Bibo SUN Lijun ZHAO Xingdong (30)
Study on Landslide Caused by Insufficient Roof Thickness in Underground to Open-pit Mining Area	SUN Shigu SONG Tengfei LIU Weidong XIAO Jian (35)
Stability Analysis and Structural Parameter Optimization of Test Stopes for Complex Broken Ore Deposit	LI Shenghui WANG Lijie LIU Zhiyi WANG Qinggang LU Hongjian GENG Shuai (41)
Analysis of the Influence of Blasting Activities on the Surrounding Rock Damage of Adjacent Roadways Based on 3D Reconstruction Technology	YU Xiangjie YUAN Haiping XIONG Lijun CHEN Chen ZHANG Yu (46)
Straight-hole Cutting Blasting Test and Control Measures in an Underground Metal Mine	WANG Ping (52)
Study on the Distribution Laws of Lateral Force Induced by the Drawing Ore and Orebody Dip	LIU Yang HE Rongxing REN Fengyu ZHANG Dongjie (57)
Dynamic Characteristics and Energy Dissipation Law of Limestone under Impact Loading	LI Binglei YUAN Yanwei CAO Yangbing ZHANG Sui WANG Wugong (61)
Blasting Vibration Duration Analysis Considering Elevation and Energy	BAO Song GUO Lianjun MO Hongyi XU Zhenyang (67)
Influence of Ore Fragmentation Based on PFC in Ore Drawing Effect of Orepass	LI Ben LI Zhiguo LI Guoshu SONG Jinfeng HUANG Shijie (71)
Influence of Silver Ion on Leaching of Copper by Bacteria from Arsenic-containing Ore	LIU Jinyan GAO Lei LIU Zhiyuan XIN Jingjing WU Zengling (76)
Experimental Study on Microwave Magnetization Roasting of Siderite	ZHOU Tingbo YAN Qianqian CHEN Ruizhe WEI Xiaotong ZHANG Shumin SUN Yongsheng (82)
Research on Innovative Technology of High Efficiency Separation of Donganshan Iron Ore	YANG Guang MA Zifei YANG Huili YUAN Libin SUN Yongsheng (88)
The Mechanism of Poly(4-Styrenesulfonic Acid-co-Maleic Acid) Sodium Salt in the Removal of Dolomite from Apatite	GUAN Zhiwen YANG Bingqiao ZENG Mengyuan LUO Huihua DENG Bing (95)
Pulp Rheology in Mineral Flotation: A Review	ZOU Yuchao WANG Lei LI Guosheng (102)
Process Mineralogy Study of Pingtaishan Vanadium-containing Stone Coal Ore in Dunhuang	BAI Zhe HAN Yuxin JIN Jianping LI Yanjun SUN Yongsheng (109)
Research Progress of Cassiterite Separation Process and Reagent	ZHANG Wenjie HUA Zhongbao XIE Xian CHEN Yumeng CAO Yang TONG Xiong FENG Dongxia (116)
Discovery of the First Continental Volcanic Subvolcanic Hydrothermal Pb-Zn Deposit in Daqishan, Beishan, Gansu Province: Successful Case of Geochemical Prospecting	DING Shuhong YE Honggang WEI Wanlong (122)
Geochemical Characteristics and Prospecting Direction of Soil Sediments in Qingtang Area, Southern Jiangxi Province	XUE Yingshan YUAN Huixiang HE Genwen (131)
Long Time-series Surface Deformation Monitoring Method of Zhangshuanglou Coal Mine Based on DS-InSAR	ZHAO Lifeng FAN Hongdong QU Junfeng LI Tengteng (142)
Track Obstacle Intelligent Recognition Technology of Mine Electric Locomotive Based on Image Processing	YU Qianxiang ZHANG Yuansheng (150)
Prospects for the Application of 5G Technology in the Construction of Non-coal Smart Mines	HU Naimin (158)
Prediction of Slope Stability of Open-pit Mine Dump Based on Machine Learning	QIN Chiyue ZHANG Wenxing (164)
Study on the Preparation of Iron Tailings Vegetation Concrete and Its Plant Suitability	SONG Jianwei LIU Shuo YUAN Yunxu XIA Dong LU Mingxing (170)
Classification and Evaluation of Soil Quality of an Open-pit Mine Dump in Xinjiang	SUN Xueliang ZHAO Jiangang YU Qinfei LI Xiaonan LI Xinying ZHANG Kai (178)
Study on Photocatalytic Performance of TiO ₂ @Bacillus	LI Guanchao ZHU Xuan TENG Qing LIU Shengyu YANG Zhichao (186)
Remediation Effect of Curing Agent on Compound Contaminated Soil by Vanadium and Chromium	DONG Yingbo CHEN Danni LIN Hai (196)
PIV Experimental Research on Wind Speed Distribution Characteristics of the Roadway Flow Field under the Side Wall Support	SONG Ying ZHU Meng DENG Lijun WANG Dong (203)
Study on Hydration Characteristics of Permeable Brick Produced by Roasted Iron Tailings	NAN Xiaojie WANG Shuai LIU Liwei ZHAO Libing (208)
Preparation and Properties of Foamed Ceramics from Gold Tailings and Coal Gangue	SUN Xiaogang MA Zhengyu ZHAO Jiaqi YAN Yuchen WANG Yubin PAN Jianda QIU Jingping (214)