



ISSN 1003-6326
CODEN TNMCEW

Transactions of Nonferrous Metals Society of China

中国有色金属学报(英文版)

February 2015

Volume 25 Number 2

www.tnmsc.cn
f-ysxb@csu.edu.cn

CONTENTS

Structural Materials

- Influence of pouring temperature on solidification behavior, microstructure and mechanical properties of sand-cast Mg–10Gd–3Y–0.4Zr alloy.....Song PANG, Guo-hua WU, Wen-cai LIU, Liang ZHANG, Yang ZHANG, Hans CONRAD, Wen-jiang DING (363)
- Effect of multi-step slow shot speed on microstructure of vacuum die cast AZ91D magnesium alloyQing-liang WANG, Shou-mei XIONG (375)
- Microstructure and mechanical properties of AZ61 magnesium alloy prepared by repetitive upsetting-extrusionYan XU, Lian-xi HU, Yu SUN, Jian-bo JIA, Ju-fu JIANG, Qing-guo MA (381)
- Microstructures and mechanical properties of laser welded wrought fine-grained ZK60 magnesium alloyHong-ge YAN, Qiang ZHAO, Ping CHEN, Ji-hua CHEN, Bin SU (389)
- Influence of high frequency vibration on microstructure and mechanical properties of TIG welding joints of AZ31 magnesium alloy.....Tong WEN, Shi-yao LIU, Shi CHEN, Lan-tao LIU, Chen YANG (397)
- Interfacial morphology evolution in directionally solidified Al–1.5%Cu alloyMin QU, Lin LIU, Yan CUI, Feng-bin LIU (405)
- Tensile properties and hot extrusion behavior of ZnO-coated Mg₂B₂O_{5w}/6061 Al compositesFeng-yuan CHEN, Bin-bin TANG, Pei-peng JIN, Lei ZHANG, Wei-dong FEI (412)
- Process parameters optimization of Ti–6Al–4V alloy sheet during hot stretch-creep formingJun-jie XIAO, Dong-sheng LI, Xiao-qiang LI, Pan DING, Kai ZHAO, Xuan-zhao HUANG, Ming-jin XU (420)
- Evaluation of dynamic performance and ballistic behavior of Ti–5Al–5Mo–5V–3Cr–1Zr alloyYan-ling WANG, Song-xiao HUI, Rui LIU, Wen-jun YE (429)
- Effect of standard heat treatment on microstructure and properties of borided Inconel 718De-wei DENG, Chun-guang WANG, Qian-qian LIU, Ting-ting NIU (437)
- High temperature mechanical behavior of alumina dispersion strengthened copper alloy with high content of aluminaZi-qi XIANG, Zhou LI, Qian LEI, Zhu XIAO, Yong PANG (444)

Functional Materials

- Effects of surface roughness of substrate on properties of Ti/TiN/Zr/ZrN multilayer coatingsSong-sheng LIN, Ke-song ZHOU, Ming-jiang DAI, Fang HU, Qian SHI, Hui-jun HOU, Chun-bei WEI, Fu-qiu LI, Xin TONG (451)
- Thermal properties of glass–ceramic bonded thermal barrier coating system.....S. GHOSH (457)
- Target effects on electrical properties and laser induced voltages of La_{0.72}Ca_{0.28}MnO₃ thin films prepared by pulsed laser depositionHui ZHANG, Wen-zhang WANG, Qi CUI, Dong YE, Ji MA, Qing-ming CHEN, Xiang LIU (465)
- Sol–gel preparation, corrosion resistance and hydrophilicity of Ta-containing TiO₂ films on Ti6Al4V alloyTao FU, Jian-min SUN, Zafer ALAJMI, Feng WU (471)
- Effects of Ti and Be addition on microstructure and mechanical properties of Mg_{58.5}Cu_{30.5}Y₁₁ bulk metallic glassKe-qiang QIU, Lin WANG, Ying-lei REN, Rong-de LI (477)
- Effect of cetyltrimethylammonium bromide on morphology and porous structure of mesoporous hydroxyapatiteJing WANG, Su-ping HUANG, Kun HU, Ke-chao ZHOU, Hong SUN (483)
- Arginine functionalized hydroxyapatite nanoparticles and its bioactivity for gene deliveryGuo-hui WANG, Yan-zhong ZHAO, Juan TAN, Shai-hong ZHU, Ke-chao ZHOU (490)
- Thermal decomposition of magnesium ammonium phosphate and adsorption properties of its pyrolysis products toward ammonia nitrogen.....Yi-qing CHEN, Jian-jun TANG, Wen-long LI, Zhen-hui ZHONG, Juan YIN (497)
- Preparation and photocatalytic performance of Cu-doped TiO₂ nanoparticlesXi-jia YANG, Shu WANG, Hai-ming SUN, Xiao-bing WANG, Jian-she LIAN (504)
- Effect of preparation routes on activity of Ag–MnO_x/C as electrocatalysts for oxygen reduction reaction in alkaline media.....Qiu-mei WU, Jian-ming RUAN, Zhong-cheng ZHOU, Shang-bin SANG (510)

- Effect of Sn substitution for Co on microstructure and electrochemical performance of AB₅ type
 $\text{La}_{0.7}\text{Mg}_{0.3}\text{Al}_{0.3}\text{Mn}_{0.4}\text{Co}_{0.5-x}\text{Sn}_x\text{Ni}_{3.8}$ ($x=0-0.5$) alloys.....Julio Cesar Serafim CASINI, Zai-ping GUO,
Hua-kun LIU, Elinor Affonso FERREIRA, Rubens Nunes FARIA, Hidetoshi TAKIISHI (520)
- Synthesis and electrochemical properties of LiNi_{0.87}Co_{0.10}Mg_{0.03}O₂ cathode materials
.....Long-zheng DENG, Feng WU, Xu-guang GAO, Zhen-tian LIU, Hai-ming XIE (527)

Computational Materials Science and Numerical Modelling

- Effect of cooling rates on clustering towards icosahedra in rapidly solidified Cu₅₆Zr₄₄ alloy
.....Yan-jun HU, Da-dong WEN, Yuan-qi JIANG, Yong-he DENG, Ping PENG (533)
- Phase-field study on competition precipitation process of Ni-Al-V alloy
.....Yan-li LU, Guang-ming LU, De-wei JIA, Zheng CHEN (544)
- Evolution of stresses in metal injection molding parts during sintering
.....Wei FANG, Xin-bo HE, Rui-jie ZHANG, Shi-di YANG, Xuan-hui QU (552)
- Dynamic response and numerical simulation of Al-Sc and Al-Ti alloys under high-speed impact
.....Wei-gui ZHANG, Liang-ju HE, Pei-jie LI, Yi-cong YE, Xue FENG, L. S. NOVIKOV (559)

Mine Engineering, Metallurgical Engineering, Chemistry and Chemical Engineering

- Failure properties of rocks in true triaxial unloading compressive test
.....Kun DU, Xi-bing LI, Di-yuan LI, Lei WENG (571)
- Self-heating tendency evaluation of sulfide ores based on nonlinear multi-parameters fusion
.....Wei PAN, Chao WU, Zi-jun LI, Yue-ping YANG (582)
- Electronic structure and flotation behavior of complex mineral jamesonite
.....Cui-hua ZHAO, Jian-hua CHEN, Yu-qiong LI, Qian HE, Bo-zeng WU (590)
- Treatment of copper-rich gold ore by cyanide leaching, ammonia pretreatment and ammoniacal cyanide leaching
.....A. D. BAS, E. KOC, E. Y. YAZICI, H. DEVECI (597)
- Interaction of sulfur with iron compounds in sodium aluminate solutions
.....Xiao-bin LI, Chong-ying LI, Zhi-hong PENG, Gui-hua LIU, Qiu-sheng ZHOU, Tian-gui QI (608)
- Role of hydrazine and hydrogen peroxide in aluminium hydroxide precipitation from sodium aluminate solution
.....N. K. SAHU, C. K. SARANGI, B. DASH, B. C. TRIPATHY,
B. K. SATPATHY, D. MEYRICK, I. N. BHATTACHARYA (615)
- Leaching and recovery of zinc from leaching residue of zinc calcine based on membrane filter press
.....Zhen-guang RU, Cen-xuan PAN, Gui-hua LIU, Xue-ting WANG, Guang-yu DOU, Ke-song ZHU (622)
- Preparation of potassium salt with joint production of spherical calcium carbonate from sintering dust
.....Guang ZHAN, Zhan-cheng GUO (628)
- Separation and enrichment of elemental sulfur and mercury from hydrometallurgical zinc residue using sodium sulfide.....Zi-yang WANG, Xiao-lan CAI, Ze-biao ZHANG, Li-bo ZHANG, Shi-xing WANG, Jin-hui PENG (640)
- Copper adsorption by natural manganese dioxide.....Nizamettin DEMIRKIRAN (647)
- Corrosion behavior of brass coinage in synthetic sweat solution
.....Cheng-hao LIANG, Shu-sen WANG, Nai-bao HUANG, Peng WANG (654)
- Corrosion wear synergistic behavior of Hastelloy C276 alloy in artificial seawater
.....Jun CHEN, Jian-zhang WANG, Feng-yuan YAN, Qing ZHANG, Quan-an LI (661)
- Dynamic interacting relationships among international oil prices, macroeconomic variables and precious metal prices
.....Xue-hong ZHU, Jin-yu CHEN, Mei-rui ZHONG (669)

Editorial Committee of Transactions of Nonferrous Metals Society of China.....(Inside front cover)
Information for Contributors.....(Inside back cover)

Managing Editors: Xiang-qun LI, Wei-ping CHEN

Serial parameter: CN43—1239/TG*1991*m*A4*314*en*P* \$50.00*1000*40*2015-02

目次

结构材料

- 浇注温度对砂型铸造 Mg-10Gd-3Y-0.4Zr 合金凝固行为、组织与性能的影响 庞松, 吴国华, 刘文才, 张亮, 张扬, Hans CONRAD, 丁文江 (363)
分段慢压射速度对 AZ91D 镁合金真空压铸件组织的影响 王青亮, 熊守美 (375)
循环镦-挤制备 AZ61 镁合金的显微组织与力学性能 徐岩, 胡连喜, 孙宇, 贾建波, 姜巨福, 马庆国 (381)
激光焊接 ZK60 变形镁合金的组织和力学性能 严红革, 赵嫱, 陈瓶, 陈吉华, 苏斌 (389)
高频振动对 AZ31 镁合金 TIG 焊接接头微观组织与力学性能的影响 温彤, 刘诗尧, 陈世, 刘澜涛, 杨臣 (397)
Al-1.5%Cu 合金定向凝固界面形态演化 屈敏, 刘林, 崔岩, 刘峰斌 (405)
氧化锌涂覆硼酸镁晶须增强 6061 铝基复合材料的拉伸性能和热挤压行为 陈逢源, 唐彬彬, 金培鹏, 张磊, 费维栋 (412)
热拉伸蠕变成形 Ti-6Al-4V 板材的工艺参数优化 肖军杰, 李东升, 李小强, 丁盼, 赵凯, 黄烜昭, 续明进 (420)
Ti-5Al-5Mo-5V-3Cr-1Zr 钛合金动态性能与弹道行为 王艳玲, 惠松骁, 刘睿, 叶文君 (429)
标准热处理对 718 硼化镍铬合金显微组织和性能的影响 邓德伟, 王春光, 刘倩倩, 牛婷婷 (437)
高浓度氧化铝弥散强化铜合金的高温力学行为 向紫琪, 李周, 雷前, 肖柱, 庞咏 (444)

功能材料

- 基体材料表面粗糙度对 Ti/TiN/Zr/ZrN 多层膜性能的影响 林松盛, 周克崧, 代明江, 胡 芳, 石 倩, 侯惠君, 韦春贝, 李福球, 佟 鑫 (451)

玻璃-陶瓷基粘接层热障涂层体系的热学性能 S. GHOSH (457)

脉冲激光沉积镀膜工艺中不同靶材制备方法对 $\text{La}_{0.72}\text{Ca}_{0.28}\text{MnO}_3$ 薄膜电学性能和激光感生电压的影响 张 辉, 王文章, 崔 琦, 业 冬, 马 吉, 陈清明, 刘 翔 (465)

Ti6Al4V 合金表面含钽 TiO_2 薄膜的溶胶-凝胶法制备、耐蚀性和亲水性 付 涛, 孙见敏, Zafer ALAJMI, 吴 锋 (471)

Ti 和 Be 对 $\text{Mg}_{58.5}\text{Cu}_{30.5}\text{Y}_{11}$ 大块金属玻璃显微组织和力学性能的影响 邱克强, 王 琳, 任英磊, 李荣德 (477)

CTAB 对于介孔羟基磷灰石形貌和孔结构的影响 王 晶, 黄苏萍, 胡 塘, 周科朝, 孙 虹 (483)

纳米羟基磷灰石的精氨酸修饰及其基因转染活性 王国慧, 赵颜忠, 谭 娟, 朱晒红, 周科朝 (490)

磷酸铵镁的热分解行为及热分解产物的氨基吸附性能 陈益清, 唐建军, 李文龙, 钟振辉, 尹 娟 (497)

掺铜二氧化钛纳米颗粒的制备及其催化性能 杨希佳, 王 媛, 孙海明, 王晓兵, 连建设 (504)

制备路线对碱性介质氧还原反应电催化剂 $\text{Ag}-\text{MnO}_x/\text{C}$ 催化活性的影响 伍秋美, 阮建明, 周忠诚, 桑商斌 (510)

Sn 替换 Co 对 AB_5 型 $\text{La}_{0.7}\text{Mg}_{0.3}\text{Al}_{0.3}\text{Mn}_{0.4}\text{Co}_{0.5-x}\text{Sn}_x\text{Ni}_{3.8}$ ($x=0-0.5$) 合金显微结构和电化学性能的影响 Julio Cesar Serafim CASINI, Zai-ping GUO, Hua-kun LIU, Elinor Affonso FERREIRA, Rubens Nunes FARIA, Hideyoshi TAKIISHI (520)

$\text{LiNi}_{0.87}\text{Co}_{0.10}\text{Mg}_{0.03}\text{O}_2$ 正极材料的合成和电化学性能 邓龙征, 吴 锋, 高旭光, 刘震天, 谢海明 (527)

计算材料学及数值模拟

- 冷却速度对快凝 Cu₅₆Zr₄₄ 合金二十面体团簇化的影响.....胡艳军,文大东,蒋元祺,邓永和,彭平 (533)
相场方法研究 Ni-Al-V 合金的竞争沉淀过程.....卢艳丽,卢广明,贾德伟,陈铮 (544)
粉末注射成形坯体在烧结过程中的应力演化.....方伟,何新波,张瑞杰,杨诗棣,曲选辉 (552)
Al-Sc 和 Al-Ti 靶材在高速撞击下的动态响应以及数值模拟
.....张伟贵,何良菊,李培杰,叶益聪,冯雪, L. S. NOVIKOV (559)

矿业工程 · 冶金工程 · 化学与化工

- 真三轴卸载试验中岩石的破裂特性.....杜坤,李夕兵,李地元,翁磊 (571)
基于非线性多参数融合的硫化矿石自热倾向性评价.....潘伟,吴超,李孜军,杨月平 (582)
复杂矿物脆硫锑铅矿的电子结构与浮选行为.....赵翠华,陈建华,李玉琼,何茜,吴伯增 (590)
氰化浸出、氨预处理及氨氰浸出法处理富铜金矿.....A. D. BAS, E. KOC, Y. YAZICI E, H. DEVECI (597)
铝酸钠溶液中硫和铁组元间的相互作用.....李小斌,李重洋,彭志宏,刘桂华,周秋生,齐天贵 (608)
联氨和过氧化氢对铝酸钠溶液中沉淀氢氧化铝的影响.....N. K. SAHU, C. K. SARANGI,
B. DASH, B. C. TRIPATHY, B. K. SATPATHY, D. MEYRICK, I. N. BHATTACHARYA (615)
利用隔膜压滤机从电解锌浸出渣中浸出与回收锌.....汝振广,潘涔轩,刘闰华,王雪婷,窦广玉,朱克松 (622)
烧结电除尘灰浸出液中回收钾盐及联产球形碳酸钙.....詹光,郭占成 (628)
采用硫化钠分离富集湿法炼锌渣中汞与硫.....王子阳,蔡晓兰,张泽彪,张利波,王仕兴,彭金辉 (640)
利用天然二氧化锰吸附铜.....Nizamettin DEMIRKIRAN (647)
模拟汗液中铜币的腐蚀行为.....梁成浩,王树森,黄乃宝,王鹏 (654)
Hastelloy C276 合金在模拟海水环境中的腐蚀磨损协同作用.....陈君,王建章,阎逢元,张清,李全安 (661)
国际油价、宏观经济变量与贵金属价格的动态交互影响.....朱学红,谌金字,钟美瑞 (669)

责任编辑: 李向群, 陈卫萍

[期刊基本参数] CN43—1239/TG*1991*m*A4*314*en*P*\$50.00*1000*40*2015-02



Project for Enhancing International
Impact of China STM Journals

Transactions of Nonferrous Metals Society of China

中国有色金属学报(英文版)

Volume 25 Number 2, February 2015 (Monthly, started in 1991)

Superintended by China Association for Science and Technology

Sponsored by The Nonferrous Metals Society of China

Managed by Central South University

Chief Editor: HUANG Bai-yun

Deputy Chief Editors: QIU Guan-zhou and PENG Chao-qun

Editorial Director: YUAN Sai-qian

Deputy Editorial Director: CHEN Wei-ping

Edited by the Editorial Office of Transactions of Nonferrous Metals Society of China

(Address: Central South University, Changsha 410083, China)

Published by Elsevier Ltd and Science Press

Printed by Printing House of Hunan Academy of Agricultural Sciences

Tel: +86-731-88830949 Fax: +86-731-88877197

<http://www.tnmsc.cn>; www.ysxcbn.com E-mail: f-ysxb@csu.edu.cn

Copyright by The Nonferrous Metals Society of China.

All rights reserved. This publication or any part thereof may not
be reproduced in any form without permission of the copyright owner.

ISSN 1003-6326



ISSN 1003-6326

CN 43-1239/TG

Domestic Distribution Code: 42-317

万方数据