

1956年创刊

EI 收录期刊

中文核心期刊

ISSN 1001-4381

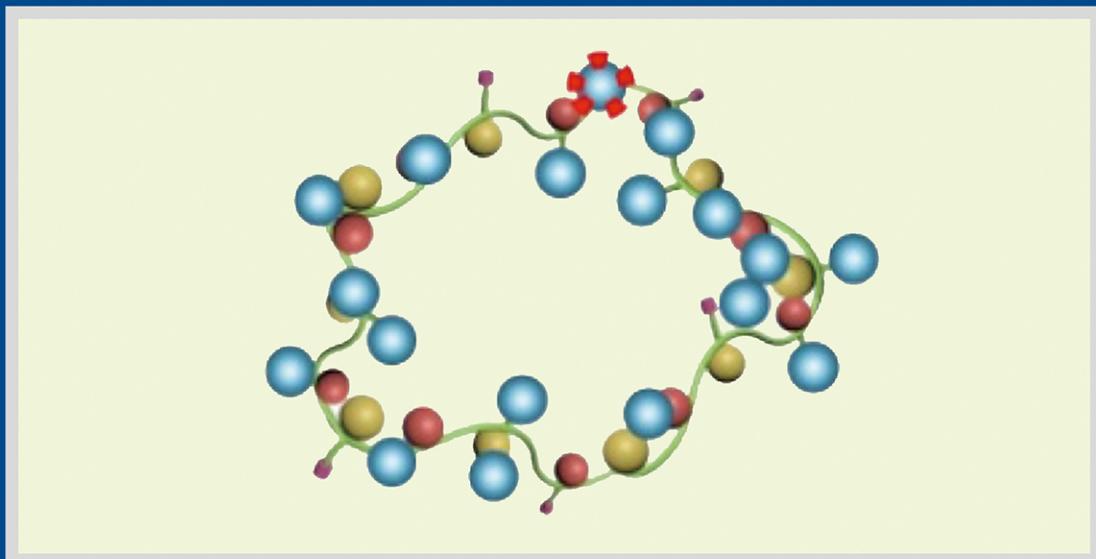
CODEN CAGOEW

# 材料工程

## 12 2020

JOURNAL OF MATERIALS ENGINEERING

第48卷 | Vol.48



ISSN 1001-4381



万方数据



中国航发北京航空材料研究院 主办

2020 年第 48 卷第 12 期 (总第 451 期)

## 目 次

## 综 述

## CNTs-纤维增强树脂基复合材料纳米-介观尺度数值模拟研究进展

- ..... 廖向娜, 贺雍律, 张鉴炜, 鞠 苏, 江大志, 刘佳音, 刘 钧 (1)  
基于层层自组装技术的复合聚电解质及其应用研究进展 ..... 张 帅, 黄燕萍, 赵国敏, 潘明珠 (12)  
三维石墨烯的制备及其在电阻型气体传感器领域的应用 ..... 安 飞, 孙 冰, 李 娜, 王世强, 王浩志 (24)  
汽车领域纤维复合材料构件轻量化设计与工艺研究进展 ..... 陈一哲, 赵 越, 王 辉 (36)  
高导热金刚石/铝复合材料的研究进展 ..... 刘 园, 崔 岩, 郭开金, 曹雷刚, 杨 越 (44)

## 研究论文

自支撑三维多孔 Cu@SnO<sub>2</sub> 膜电极的制备及储锂性能 ..... 杨 欢, 乔志军, 张志佳, 康建立, 于镇洋 (53)  
可注射海藻酸钠/泊洛沙姆复合水凝胶的制备及药物缓释研究

- ..... 候冰娜, 郑泽邻, 赵梓年, 李 进, 倪 凯, 赵琳琳, 李征征 (60)  
明胶辅助共沉淀法合成硫化铜纳米材料及其光热消融癌细胞 ..... 余宛键, 耿 鹏, 文 玮, 陈志钢 (68)  
退火温度对 PECVD 法制备 SiO<sub>2</sub>/Si<sub>3</sub>N<sub>4</sub> 光学薄膜性能的影响 ..... 吴立宇, 李小强, 王 斌, 屈盛官 (75)  
g-C<sub>3</sub>N<sub>4</sub> 纳米片光电极的制备及其光电催化降解四环素性能 ..... 胡晓峰, 彭清琪, 张文华, 叶文华, 王辉虎 (82)  
掺杂锆对 CeO<sub>2</sub>-ZrO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub> 复合氧化物还原热处理性能的影响

杨黄根, 谭喻方, 韦庆敏, 晏 全, 陈 渊, 朱立刚, 覃利琴, 肖益鸿 (90)  
相变蜡@聚乙烯醇储能调温整理液的制备及其在棉织物上的应用 ..... 刘国金, 石 峰, 张国庆, 周 岚 (97)  
中间退火前的冷轧变形量对 6A16 铝合金组织与性能的影响

- ..... 闫丽珍, 张永安, 熊柏青, 李锡武, 李志辉, 陈凯欣 (103)  
6061 铝合金膨胀-连续剪切变形行为 ..... 项 瑶, 卢立伟, 吴木义, 马 曼, 康 伟, 刘 欢, 唐伦圆 (111)  
球磨时间对粉末冶金制备超细晶 Mg-3Al-Zn 合金组织及力学性能的影响 ..... 房 威, 李继光, 杜正勇 (119)  
316L 超薄板激光焊接的失稳变形规律 ..... 张景祺, 林 健, 雷永平, 许海亮, 王细波 (126)  
循环热处理对 1Cr-0.5Mo 钢碳化物演变和冲击韧性的影响

陈广兴, 张勇伟, 许晓端, 徐 琦, 李红英, 赵明纯 (135)  
应变率对 TB17 钛合金亚稳  $\beta$  晶粒变形机制的影响

- ..... 信云鹏, 朱知寿, 王新南, 商国强, 祝力伟, 李明兵, 李 静, 刘格辰 (141)  
不同冷却速率条件下 Y 对重力浇铸 ZL114A 共晶硅和力学性能的影响

吴 楷, 刘闪光, 陆 政, 毛郭灵, 严 寒 (148)  
原始层厚比对 Ni/Al 多层含能结构材料放热性能及力学性能的影响 ..... 丁青云, 骆心怡, 陶 杰, 廖 莎 (156)

封面照片：明胶辅助共沉淀法合成硫化铜纳米材料及其光热消融癌细胞（见余宛键等论文，第 70 页图 1）

责任编辑 王 昶

## CONTENTS

### REVIEW

- Research progress in nano-meso scale modelling of carbon nanotube reinforced FRP composites ..... LIAO Xiang-na, HE Yong-lyu, ZHANG Jian-wei, JU Su, JIANG Da-zhi, LIU Jia-yin, LIU Jun( 1 )  
Research progress in polyelectrolyte complexes based on layer-by-layer self-assembly technology and their applications ..... ZHANG Shuai, HUANG Yan-ping, ZHAO Guo-min, PAN Ming-zhu(12)  
Research on the fabrication of 3D graphene and its application in chemiresistive gas sensors ..... AN Fei, SUN Bing, LI Na, WANG Shi-qiang, WANG Hao-zhi(24)  
Research progress on lightweight design and technology of fiber reinforced plastics components in automobile industry ..... CHEN Yi-zhe, ZHAO Yue, WANG Hui(36)  
Research progress in high thermal conductivity diamond/aluminum composites ..... LIU Yuan, CUI Yan, GUO Kai-jin, CAO Lei-gang, YANG Yue(44)

### RESEARCH ARTICLE

- Preparation and lithium storage properties of free-standing and three-dimensional porous Cu@SnO<sub>2</sub> membrane electrode ..... YANG Huan, QIAO Zhi-jun, ZHANG Zhi-jia, KANG Jian-li, YU Zhen-yang(53)  
Preparation of injectable sodium alginate/poloxamer composite hydrogel for sustained drug release ..... HOU Bing-na, ZHENG Ze-lin, ZHAO Zi-nian, LI Jin, NI Kai, ZHAO Lin-lin, LI Zheng-zheng(60)  
Gelatin-mediated coprecipitation synthesis of copper sulfide nanoparticles for photothermal ablation of cancer cells ..... YU Wan-jian, GENG Peng, WEN Mei, CHEN Zhi-gang(68)  
Effect of annealing temperature on properties of SiO<sub>2</sub>/Si<sub>3</sub>N<sub>4</sub> optical films prepared by PECVD method ..... WU Li-yu, LI Xiao-qiang, WANG Bin, QU Sheng-guan(75)  
Preparation of g-C<sub>3</sub>N<sub>4</sub> nanosheets photoelectrode and its photoelectrocatalytic activity for tetracycline degradation ..... HU Xiao-feng, PENG Qing-qi, ZHANG Wen-hua, YE Wen-hua, WANG Hui-hu(82)  
Influence of doping Zr on the performance of CeO<sub>2</sub>-ZrO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub> composite oxide after reductive heat treatment ..... YANG Huang-gen, TAN Yu-fang, WEI Qing-min, YAN Quan, CHEN Yuan, ZHU Li-gang, QIN Li-qin, XIAO Yi-hong(90)  
Preparation of phase change wax@polyvinyl alcohol thermo-regulated finishing agents and its applications on cotton fabrics ..... LIU Guo-jin, SHI Feng, ZHANG Guo-qing, ZHOU Lan(97)  
Effect of cold rolling deformation before intermediate annealing on microstructure and properties of 6A16 aluminum alloy ..... YAN Li-zhen, ZHANG Yong-an, XIONG Bai-qing, LI Xi-wu, LI Zhi-hui, CHEN Kai-xin(103)  
Expansion-continuous shear deformation behavior of 6061 aluminum alloy ..... XIANG Yao, LU Li-wei, WU Mu-yi, MA Min, KANG Wei, LIU Huan, TANG Lun-yuan(111)  
Effect of ball milling time on microstructure and mechanical properties of ultrafine-grained Mg-3Al-Zn alloy prepared by powder metallurgy ..... FANG Wa, LI Ji-guang, DU Zheng-yong(119)  
Instability deformation analysis of laser welded joint of 316L ultra-thin plate ..... ZHANG Jing-qi, LIN Jian, LEI Yong-ping, XU Hai-liang, WANG Xi-bo(126)  
Effect of cyclic heat treatment on carbide evolution and impact toughness of 1Cr-0.5Mo steel ..... CHEN Guang-xing, ZHANG Yong-wei, XU Xiao-chang, XU Chen, LI Hong-ying, ZHAO Ming-chun(135)  
Effect of strain rate on deformation mechanism of metastable  $\beta$  grains in TB17 titanium alloy ..... XIN Yun-peng, ZHU Zhi-shou, WANG Xin-nan, SHANG Guo-qiang, ZHU Li-wei, LI Ming-bing, LI Jing, LIU Ge-chen(141)  
Effect of Y on ZL114A eutectic silicon and mechanical properties with gravity casting under different cooling rates ..... WU Zhen, LIU Shan-guang, LU Zheng, MAO Guo-ling, YAN Han(148)  
Effects of original layer thickness ratio on exothermic and mechanical properties of Ni/Al multilayered energetic structural composites ..... DING Qing-yun, LUO Xin-yi, TAO Jie, LIAO Sha(156)