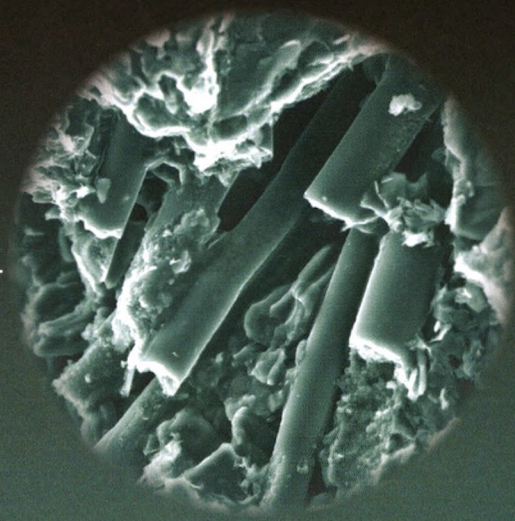




# 复合材料学报



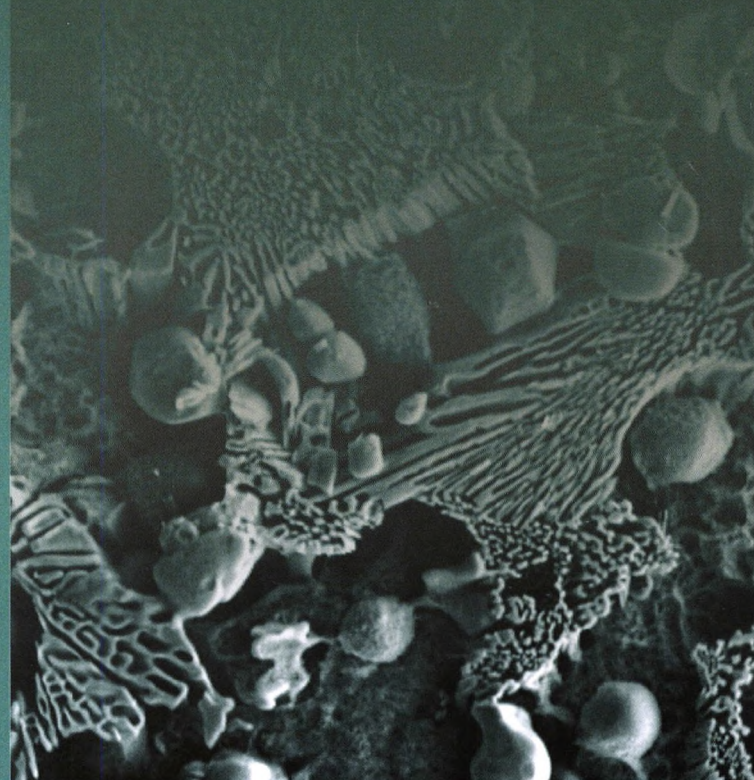
## Acta Materiae Compositae Sinica



# 2021. 3

北京航空航天大学 主办  
中国复合材料学会

万方数据





### 目 次

#### 综述

- 珍珠母及其仿生复合材料力学行为的研究进展 ..... 卢子兴, 崔少康, 杨振宇 (641)
- 超高温氧化物陶瓷激光增材制造技术与缺陷控制研究进展 .....  
..... 申仲琳, 苏海军, 刘海方, 刘园, 赵迪, 郭敏, 张军, 刘林, 傅恒志 (668)
- 石墨烯基聚合物复合电解质的设计、性能及其应用研究进展 ..... 杨富杰, 王亮, 阮文红, 章明秋, 容敏智 (680)
- 纤维增强形状记忆聚合物复合材料及其航天应用 ..... 张豆, 刘彦菊, 冷劲松 (698)
- 量子点/TiO<sub>2</sub> 复合光催化材料的研究进展 ..... 卫思颖, 马建中, 范倩倩 (712)

#### 树脂基复合材料

- 石墨烯纳米片/(酚酞聚芳醚酮-环氧树脂) 双逾渗导热复合材料的制备和性能 .....  
..... 欧阳泽宇, 王珂珂, 饶琼, 张志龙, 扶碧波, 彭雄奇 (722)
- 聚酰亚胺颗粒层间增韧碳纤维/邻苯二甲腈树脂复合材料 .....  
..... 赵泽华, 孙劲松, 郭颖, 李丽英, 李峥, 王国勇, 杨亚聘, 周恒, 李敏, 赵彤 (732)
- 电纺制备聚丙烯腈/聚偏氟乙烯复合纤维膜及其空气过滤性能 .....  
..... 李俊, 伍文静, 孙金玺, 钱琦一, 唐逸飞, 张明洋 (741)
- 改性剂对纳米片状羟基磷灰石/聚乳酸复合材料性能的影响 .....  
..... 黄桔煊, 万怡灶, 朱享波, 张全超, 杨志伟, 罗红林 (749)
- 抗氧化剂/光稳定剂对 3D 打印光致变色木塑复合材料性能的影响 ..... 杨海英, 郭蕊, 任泽春, 许氏 (761)
- 多壁碳纳米管-聚氨酯/聚丙烯复合材料导电网络结构的演变与性能调控 .....  
..... 赵中国, 艾桃桃, 刘国瑞, 吴佩军, 贾仕奎, 申思扬 (770)
- 碳纤维/聚醚醚酮单向带各向异性导电行为的尺度效应 ... 张金纳, 王朝阳, 朱世杰, 杨向涛, 吴海宏, 黄明 (780)
- 微胶囊层间增韧碳纤维/环氧树脂复合材料力学性能的超声导波评价 ... 王奔, 于晓启, 赵国旗, 骆英, 郝文峰 (788)
- 碳纤维增强环氧树脂复合材料金字塔点阵夹芯假脚结构在竖向载荷下的力学性能 .....  
..... 唐玉玲, 陈浩, 平学成, 张琰 (797)
- 树脂传递模塑成型复合材料机翼干斑成因及控制方法 ..... 宋国莲, 郑锡涛, 刘振东, 陈牛 (809)

#### 金属和陶瓷基复合材料

- 纳米核壳型 Ag@Fe<sub>3</sub>O<sub>4</sub> 复合材料的制备、催化及抑菌性能 .....  
..... 郭少波, 梁艳莉, 季晓晖, 兰阿峰, 黄佩, 杜全超, 马剑琪 (816)

不连续界面相  $Al_4C_3$  对 SiC/Al 复合材料界面结合影响的第一性原理及实验 .....  
..... 邹爱华, 周贤良, 康志兵, 吴开阳, 苏玉琴 (824)

## 其他

可循环利用 BiOBr/石墨烯水凝胶复合材料的制备及其对丁基钠黄药的降解性能 .....  
..... 常亮亮, 于艳, 曹宝月, 乔成芳 (832)

用于空气过滤的改性大豆蛋白-细菌纤维素复合材料的制备及性能 .....  
..... 贺玮, 刘晓彤, 郑裕东, 王慧颖, 谢亚杰, 冯照喧, 王岩森, 刘晓冰 (843)

超浸润性可逆切换的超双疏复合海绵材料的制备及油水分离应用 ..... 何影格, 陈媛媛, 刘维仪, 张廷宗 (854)

Sn 量子点/石墨烯复合材料的合成及储锂性能 ... 沈丁, 储诚议, 王来贵, 董伟, 刘耀汉, 李明月, 杨绍斌 (863)

高性能自支撑  $CuS/SnS_2$  锂电池负极材料 ..... 张鹏, 刘洋, 陈明华, 孙凤莲 (871)

消泡剂和增稠剂复掺对模袋混凝土抗冻性的影响 ..... 于峰, 娄宗科, 姚汝方, 谢天逸 (879)

聚丙烯纤维增强水泥复合材料抗冲蚀性能及冲蚀机制 ..... 郝贞洪, 刘艳晨, 李永贵, 高峰 (891)

聚乙烯醇纤维增强水泥复合材料板的冲切性能 ..... 李安令, 张朝辉, 郭帅成, 朱德举 (902)

用于低温贮箱的铝合金-硬质聚氨酯泡沫夹芯共底设计与分析 .....  
..... 李克诚, 杨雷, 高东岳, 柳敏静, 徐新生, 武湛君 (911)

偏心受拉作用下预应力 CFRP 筋-型钢混凝土构件抗裂试验 ... 张鹏, 桂金洋, 邓宇, 沈民合, 孙飞, 赵晓冬 (920)

考虑拉伸刚化效应的 FRP 筋/混凝土轴拉构件变形计算方法 ..... 范兴朗, 黄俊超, 吴熙, 周欣竹 (932)

重组竹顺纹受压蠕变性能及预测模型 ..... 陈思, 魏洋, 赵鲲鹏, 杭晨, 赵康 (944)

冻融循环作用下玄武岩纤维-矿渣粉-粉煤灰混凝土压拉强度试验与微观结构 ..... 吴倩云, 马芹永, 王莹 (953)

硫酸盐环境中 CFRP 约束劣化混凝土柱的力学性能 ... 张家玮, 邵利君, 刘生纬, 罗方余, 杨治国, 张戎令 (966)

期刊基本参数 : CN 11 - 1801/TB \* 1984 \* m \* A4 \* 338 \* zh \* P \* ¥ 60.00 \* 700 \* 31 \* 2021 - 3

编辑 : 李 蓓

审校 : 韩东蔚 吴红丽

## CONTENTS

## Reviews

- Recent progress on mechanical behaviors of nacre and its bio-inspired composites ..... LU Zixing, CUI Shaokang, YANG Zhenyu ( 641 )
- Research progress on laser additive manufacturing technology and its defect control for ultra-high temperature oxide ceramics .....  
..... SHEN Zhonglin, SU Haijun, LIU Haifang, LIU Yuan, ZHAO Di, GUO Min, ZHANG Jun, LIU Lin, FU Hengzhi ( 668 )
- Research progress on design, performance and application of graphene based polymer composite electrolytes .....  
..... YANG Fujie, WANG Liang, RUAN Wenhong, ZHANG Mingqiu, RONG Minzhi ( 680 )
- Fiber reinforced shape memory polymer composites and their applications in aerospace ... ZHANG Dou, LIU Yanju, LENG Jinsong ( 698 )
- Research advances on quantum dots/TiO<sub>2</sub> composite photocatalytic materials ..... WEI Siying, MA Jianzhong, FAN Qianqian ( 712 )

## Resin Matrix Composite

- Preparation and properties of thermally conductive grapheme nanoplates/(polyetherketone cardo-epoxy) composites with double percolation structures ..... OUYANG Zeyu, WANG Keke, RAO Qiong, ZHANG Zhilong, FU Bibo, PENG Xiongqi ( 722 )
- Improving interlaminar toughness of carbon fiber/ phthalonitrile composite via polyimide .....  
... ZHAO Zehua, SUN Jinsong, GUO Ying, LI Liying, LI Zheng, WANG Guoyong, YANG Yaran, ZHOU Heng, LI Min, ZHAO Tong ( 732 )
- Preparation of polyacrylonitrile/polyvinylidene fluoride composite fiber membrane by electrospinning and its air filtration performance .....  
..... LI Jun, WU Wenjing, SUN Jinxi, QIAN Qiyi, TANG Yifei, ZHANG Mingyang ( 741 )
- Effect of modifier on properties of nano-platelet hydroxyapatite/polylactic acid composites .....  
..... HUANG Zhihuan, WAN Yizao, ZHU Xiangbo, ZHANG Quanchao, YANG Zhiwei, LUO Honglin ( 749 )
- Effect of antioxidant/light stabilizer on properties of 3D printed photochromic wood-plastic composites .....  
..... YANG Haiying, GUO Rui, REN Zechun, XU Min ( 761 )
- Evolution of conductive network and property regulation of multiwall carbon nanotubes-polyurethane/polypropylene composites .....  
..... ZHAO Zhongguo, AI Taotao, LIU Guorui, WU Peijun, JIA Shikui, SHEN Siyang ( 770 )
- Thickness effect of anisotropic conductive behavior of carbon fiber/polyetheretherketone unidirectional tape .....  
..... ZHANG Jinna, WANG Chaoyang, ZHU Shijie, YANG Xiangtao, WU Haihong, HUANG Ming ( 780 )
- Ultrasonic guided wave-based evaluation for mechanical properties of interlaminar toughening carbon fiber/epoxy composites with microcapsules .....  
..... WANG Ben, YU Xiaoqi, ZHAO Guoqi, LUO Ying, HAO Wenfeng ( 788 )
- Mechanical properties of carbon fiber reinforced epoxy composite pyramid lattice sandwich prosthetic foot structure under vertical load .....  
..... TANG Yuling, CHEN Hao, PING Xuecheng, ZHANG Yan ( 797 )
- Formation and control of dryspot in resin transfer molding process of composite wings .....  
..... SONG Guolian, ZHENG Xitao, LIU Zhendong, CHEN Niu ( 809 )

## Metal and Ceramic Matrix Composite

- Preparation, catalytic property and antibacterial property of Ag@Fe<sub>3</sub>O<sub>4</sub> core-shell composite nanomaterials .....  
..... GUO Shaobo, LIANG Yanli, JI Xiaohui, LAN Afeng, HUANG Pei, DU Quanchao, MA Jianqi ( 816 )
- Effect of discontinuous interfacial phase Al<sub>4</sub>C<sub>3</sub> on interface bonding of SiC/Al composites: A first-principle and experiment .....  
..... ZOU Aihua, ZHOU Xianliang, KANG Zhibing, WU Kaiyang, SU Yuqin ( 824 )

## Others

- Preparation of recyclable BiOBr/graphene hydrogel composite and its photodegradation of sodium butyl xanthate .....  
..... CHANG Liangliang, YU Yan, CAO Baoyue, QIAO Chengfang ( 832 )
- Preparation and properties of modified soy protein-bacterial cellulose composites for air filtration .....  
..... HE Wei, LIU Xiaotong, ZHENG Yudong, WANG Huiying, XIE Yajie, FENG Zhaoxuan, WANG Yansen, LIU Xiaobing ( 843 )

Preparation of superamphiphobic composite sponge material with super-wetting reversible switching and application in oil-water separation .....	HE Yingge, CHEN Yuanyuan, LIU Weiyi, ZHANG Yanzong ( 854 )
Synthesis and lithium storage properties of Sn quantum dots/graphene composite .....	SHEN Ding, CHU Chengyi, WANG Laigui, DONG Wei, LIU Yaohan, LI Mingyue, YANG Shaobin ( 863 )
High-performance self-supporting CuS/SnS <sub>2</sub> lithium battery anode material .....	ZHANG Peng, LIU Yang, CHEN Minghua, SUN Fenglian ( 871 )
Effect of compounding of antifoaming agent and viscosity enhancing agent on frost resistance of mold bag concrete .....	YU Feng, LOU Zongke, YAO Rufang, XIE Tianyi ( 879 )
Erosion resistance and erosion mechanism of polypropylene fiber reinforced cement composite .....	HAO Yunhong, LIU Yanchen, LI Yonggui, GAO Feng ( 891 )
Punching performance of polyvinyl alcohol fiber reinforced cementitious composite slab .....	LI Anling, ZHANG Zhaohui, GUO Shuaicheng, ZHU Deju ( 902 )
Design and analysis of aluminum alloy-rigid polyurethane foam-cored common bulkhead for cryogenic tanks .....	LI Kecheng, YANG Lei, GAO Dongyue, LIU Minjing, XU Xincheng, WU Zhanjun ( 911 )
Experiment on crack resistance of prestressed CFRP tendons-steel reinforced concrete members under eccentric tension .....	ZHANG Peng, GUI Jinyang, DENG Yu, SHEN Minhe, SUN Fei, ZHAO Xiaodong ( 920 )
Deformation analysis method of FRP bar/concrete tension members by considering tension stiffening effect .....	FAN Xinglang, HUANG Junchao, WU Xi, ZHOU Xinzhu ( 932 )
Creep performance and prediction model of bamboo scrimber under compression .....	CHEN Si, WEI Yang, ZHAO Kunpeng, HANG Chen, ZHAO Kang ( 944 )
Compression-tensile tests and meso-structure of basalt fiber-slag powder-fly ash concrete under freeze-thaw cycles .....	WU Qianyun, MA Qinyong, WANG Ying ( 953 )
Mechanical properties of CFRP confined pre-damaged concrete columns in sulfate environment .....	ZHANG Jiawei, SHAO Lijun, LIU Shengwei, LUO Fangyu, YANG Zhiguo, ZHANG Rongling ( 966 )

## 欢迎订阅《复合材料学报》

《复合材料学报》(月刊)是中国复合材料领域的基础性、学术性科技期刊;主要刊载复合材料基础研究和应用研究方面具有创造性、高水平和有重要意义的最新研究成果的论文,以及由该领域专家亲自撰写的反映本学科最新发展状况的文献综述和信息性文章;所刊载的研究成果对科学研究具有参考价值,对生产实践具有指导作用。

《复合材料学报》的学术影响力和办刊质量不断提高,2019年获批列入《中国科技期刊卓越行动计划》择优支持的梯队期刊。2020年再次被评选为“中国精品科技期刊”,并再度入选“百种中国杰出学术期刊”,入选“领跑者5000—中国科技期刊顶尖论文”库,荣获“中国百篇最具影响国内学术论文”。《复合材料学报》是美国工程索引《Ei Compendex》源期刊;同时被 Elsevier《Scopus》、《EBSCO》(全文)、美国化学文摘《CA》、俄罗斯文摘杂志《AJ》、美国应用力学评论《Appl. Mech. Rev.》(《AMR》)、剑桥科学文摘(工程类)《CSA2》等国际检索系统收录。

《复合材料学报》国内外公开发刊,邮发代号:80-413

刊号:ISSN 1000-3851;CN 11-1801/TB

每期定价60元,全年定价720元

## 复合材料学报

Fuhe Cailiao Xuebao 月刊,1984年创刊

第38卷 第3期 2021年3月出版

## Acta Materiae Compositae Sinica

Monthly, Started in 1984

Vol. 38 No. 3 Mar 2021

主管单位:工业和信息化部

主办单位:北京航空航天大学

中国复合材料学会

主 编:章明秋

编辑出版:《复合材料学报》编辑部

电 话:(010) 82316907, 82338527

网 址:<http://fhclxb.buaa.edu.cn>

印 刷:北京科信印刷有限公司

发 行:北京报刊发行局

发行范围:国内外公开发刊

Administrated by Ministry of Industry and Information

Technology of the People's Republic of China

Sponsored by Beihang University (BUAA)

Chinese Society for Composite Materials

Chief Editor: Prof. Zhang Mingqiu

Edited and Published by Editorial Office of

Acta Materiae Compositae Sinica

Tel: 0086-010-82316907, 82338527

<http://fhclxb.buaa.edu.cn>

Printed by Beijing Kexin Printing Co., Ltd

Distributed by Beijing Bureau for Distribution of

Newspapers and Journals

刊 号: ISSN 1000-3851 (国际标准连续出版物号)  
CN 11-1801/TB (中国标准连续出版物号)

国内定价:60.00元 邮发代号:80-413

ISSN 1000-3851



9 771000 385213