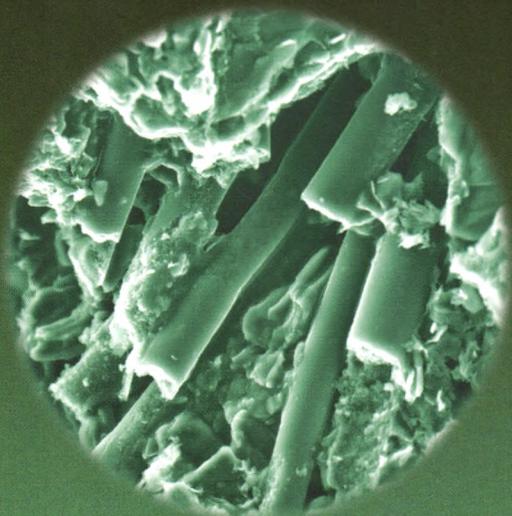


# 复合材料学报

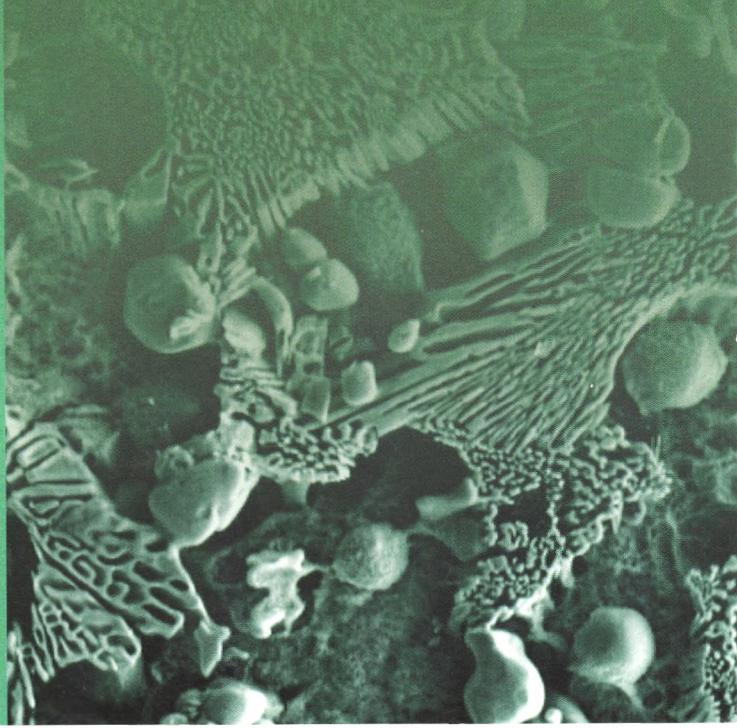
Acta Materiae  
Compositae  
Sinica



2015. 1

北京航空航天大学  
中国复合材料学会 主办

万方数据



目 次

- 非连续增强金属基复合材料剧烈塑性变形行为研究进展 ..... 韩远飞, 段宏强, 吕维洁, 王立强, 张荻 (1)  
基于层层组装法构建阻燃天然纤维素纤维织物的研究进展 ..... 张涛, 闫红强, 王丽莉, 方征平 (13)  
石墨烯-多壁碳纳米管协同增强环氧树脂复合材料的低温力学性能 ..... 沈小军, 孟令轩, 付绍云 (21)  
纳米硫酸钡/聚乙烯复合材料的制备及其加速老化性能 ..... 张晗, 陈民芳 (27)  
基于纳米压痕法的埃洛石纳米管/环氧复合材料力学性能表征 ..... 付昆昆, 郑百林, 张佳宁, 徐振忠 (32)  
数值模拟填料含量对 Cu/PTFE 复合材料摩擦性能的影响 ..... 解挺, 杨华平, 江凯 (39)  
功能化纳米石墨烯片/PP-PP-g-MAH 复合材料的制备与表征 .....  
..... 何飞雄, 卞军, 蔺海兰, 杨峰, 周强, 王刚 (47)  
苎麻纤维/聚乳酸复合材料在不同 pH 环境下的水解行为 ..... 温变英, 李晓媛, 张扬 (54)  
分级多孔壳聚糖/聚乳酸复合支架的制备及骨修复性能 .....  
..... 林燕欢, 李娜, 曾庆慧, 李志忠, 孙国栋, 丁珊, 李立华 (61)  
海水浸泡对单向 T700/环氧复合材料层间剪切性能的影响 ..... 胡照会, 高红成, 黄其忠, 彭玉刚 (68)  
蒙脱土/聚丙烯复合材料结晶形态及耐电树枝化特性 ..... 迟晓红, 俞利, 郑杰, 高俊国, 张晓虹 (76)  
聚醚铵改性蒙脱土对纳米蒙脱土/聚丙烯复合材料微观结构的影响 ..... 王小群, 马骏, 李海 (85)  
纳米 ZnO 和纳米 MMT 对低密度聚乙烯介电性能的影响 ..... 程羽佳, 郭宁, 王若石, 张晓虹 (94)  
DOPOMPC-APP-MWCNTs 协同阻燃环氧树脂的制备 ..... 卢林刚, 陈英辉, 赵瑾, 杨守生 (101)  
新型  $Ti_3AlC_2-Al_2O_3/TiAl_3$  复合材料的组织结构与性能 ..... 李晓梅, 肖华强, 曾勇, 陈维平 (108)  
 $TiC(30\text{vol}\%)/Cu-Al_2O_3$  复合材料热变形及动态再结晶 ..... 杨志强, 刘勇, 田保红, 张毅 (117)  
 $ZrB_2$  基超高温陶瓷复合材料的高温拉伸损伤行为 ..... 王玲玲, 方国东, 梁军 (125)  
凹凸棒石-针铁矿改性麦桔木质陶瓷的微观结构 ..... 吴文涛, 李妍妍, 卢茂骥, 蔡传伦 (131)  
三维织造层间增强的纤维棒复合材料细观结构模型及力学性能有限元模拟 .....  
..... 单忠德, 康怀容, 臧勇, 刘丰 (138)  
2.5D 机织复合材料压缩性能实验与数值模拟 ..... 卢子兴, 周原, 冯志海, 杨云华, 纪高宁 (150)  
拉压不同模量的缝合三明治夹芯结构梁弯曲性能 ..... 魏靖, 石多奇, 孙燕涛, 杨晓光, 曹峰 (160)  
基于材料性能时变特性的复合材料固化过程多场耦合数值模拟 .....  
..... 元振毅, 王永军, 张跃, 杨选宏, 王俊彪, 魏生民 (167)  
GBJM 方法的改进及其在含钉群复合材料结构钉载分配和承载能力分析中的应用 .....  
..... 李念, 任飞翔, 陈普会, 叶强, 孙彦鹏 (176)  
C/SiC 复合材料螺栓螺牙承载能力 ..... 卢子兴, 廖强, 杨振宇, 傅翔, 张中伟, 冯志海 (182)  
形状记忆合金的力学及界面参数和体积分数对大块金属玻璃基复合材料增韧的影响 .....  
..... 张茹远, 阚前华, 张娟, 康国政 (188)  
复合材料波纹梁冲击试验与数值模拟 ..... 孟祥吉, 燕瑛, 罗海波, 侯康, 梁祖典, 宫少波 (196)

短纤维复合材料宏微观内聚力模型参数测量的实验与数值混合法	沈珉, 张晓旭, 孙晓翔	(204)
VIMP 中结构拐角对纤维预成型体渗透特性的影响	钟勇, 肖加余, 尹笃林, 杨金水	(217)
基于概率损伤算法的复合材料板空气耦合 Lamb 波扫描成像	刘增华, 樊军伟, 何存富, 吴斌	(227)
基于遗传算法的复合材料层合板削层结构铺层优化	金达锋, 刘哲, 范志瑞	(236)
圆-方异形截面复合材料管件物能量吸收机制	马岩, 阳玉球	(243)
碳纤维增强复合材料雷击损伤实验及电-热耦合仿真	付尚琛, 周颖慧, 石立华, 司卿, 王栋, 徐吉峰	(250)
不同手工制备方法对预浸料捻子条质量的影响	黄彬瑶, 熊美蓉, 段跃新	(260)
羟乙基纤维素/海藻酸钠复合膜对六价铀的吸附性能及吸附机制	谢水波, 罗景阳, 刘清, 凌辉, 段毅, 王劲松	(268)
多相周期压电纤维复合材料反平面变形问题的解析解	徐耀玲, 肖俊华, 邱鹏凯	(276)
不同防护形式复合材料板雷击损伤分区特性	刘志强, 岳珠峰, 王富生, 姬尧尧	(284)
复合材料格栅圆柱筒稳定性数值仿真与试验	杨颜志, 郑权, 李昊, 吕榕新, 王瑞凤	(295)
《复合材料学报》征稿简则		(封三)

期刊基本参数: CN 11-1801/TB \* 1984 \* b \* A4 \* 300 \* zh \* P \* ¥80.00 \* 1100 \* 37 \* 2015-02

本期编辑: 张广萌 王小辰 李世秋 李明敏

审校: 蔡斐

## CONTENTS

Research progress on severe plastic deformation behaviors of discontinuously reinforced metal matrix composites .....	HAN Yuanfei, DUAN Hongqiang, LYU Weijie, WANG Liqiang, ZHANG Di (1)
Research progress on preparation of flame retardant natural cellulosic fiber fabric via layer-by-layer assembly method .....	ZHANG Tao, YAN Hongqiang, WANG Lili, FANG Zhengping (13)
Cryogenic mechanical properties of epoxy composites synergistically reinforced by graphene-multi-walled carbon nanotubes .....	SHEN Xiaojun, MENG Lingxuan, FU Shaoyun (21)
Preparation and accelerated-aging properties of barium sulfate nanoparticles/polyethylene composites .....	ZHANG Han, CHEN Minfang (27)
Mechanical property characterization of halloysite nanotubes/epoxy composites based on nanoindentation method .....	FU Kunkun, ZHENG Bailin, ZHANG Jianing, XU Zhenzhong (32)
Numerical simulation of influence of filler content on tribological properties of Cu/PTFE composites .....	XIE Ting, YANG Huaping, JIANG Kai (39)
Preparation and characterization of functionalized nano-graphene sheet/PP-PP-g-MAH composites .....	HE Feixiong, BIAN Jun, LIN Hailan, YANG Feng, ZHOU Qiang, WANG Gang (47)
Hydrolysis behaviors of ramie fiber/polylactic acid composites under different pH conditions .....	WEN Bianying, LI Xiaoyuan, ZHANG Yang (54)
Fabrication and bone regenerability of chitosan/polylactic acid composite scaffolds with hierarchical porous structure .....	LIN Yanhuan, LI Na, ZENG Qinhui, LI Zhizhong, SUN Guodong, DING Shan, LI Lihua (61)
Effects of seawater immersing on interlamine shear properties of unidirectional T700/epoxy composites .....	HU Zhaojun, GAO Hongcheng, HUANG Qizhong, PENG Yugang (68)
Crystallization morphology and electrical tree resistance characteristics of montmorillonite/polypropylene composites .....	CHI Xiaohong, YU Li, ZHENG Jie, GAO Junguo, ZHANG Xiaohong (76)
Effect of montmorillonite modified by poly (oxypropylene) amine hydrochlorides on microstructure of nano-montmorillonite/polypropylene composites .....	WANG Xiaoqun, MA Jun, LI Hai (85)
Effects of nano-ZnO and nano-montmorillonite on dielectric properties of low density polyethylene .....	CHENG Yujia, GUO Ning, WANG Ruoshi, ZHANG Xiaohong (94)
Preparation of DOPOMPC-APP-MWCNTs intumescence flame-retardant epoxy resin .....	LU Lingang, CHEN Yinghui, ZHAO Jin, YANG Shousheng (101)
Microstructure and properties of new type $Ti_3AlC_2-Al_2O_3/TiAl_3$ composites .....	LI Xiaomei, XIAO Huaqiang, ZENG Yong, CHEN Weiping (108)
Hot deformation and dynamic recrystallization of $TiC(30\text{vol}\%)/Cu-Al_2O_3$ composites .....	YANG Zhiqiang, LIU Yong, TIAN Baohong, ZHANG Yi (117)
High temperature tensile damage behavior of $ZrB_2$ -based ultra-high temperature ceramic composites .....	WANG Lingling, FANG Guodong, LIANG Jun (125)
Microstructure of attapulgite-goethite modified woodceramics from wheat straw .....	WU Wentao, LI Yanyan, LU Maoji, CAI Chuanlun (131)

Microscopic structure model and finite element simulation of mechanical properties of fiber-bar composites reinforced by three dimensional weaving .....	SHAN Zhongde, KANG Huairong, ZANG Yong, LIU Feng (138)
Experiment and numerical simulation on compressive properties of 2.5D woven fabric composites .....	LU Zixing, ZHOU Yuan, FENG Zhihai, YANG Yunhua, JI Gaoning (150)
Flexural properties of stitched sandwich structure beam with different modulus in tension and compression .....	WEI Jing, SHI Duoqi, SUN Yantao, YANG Xiaoguang, CAO Feng (160)
Multi-field coupled numerical simulation for curing process of composites with time-dependent properties of materials .....	YUAN Zhenyi, WANG Yongjun, ZHANG Yue, YANG Xuanhong, WANG Junbiao, WEI Shengmin (167)
An improved GBJM method and its application in bolt load distribution and load capacity analysis of composite structures with bolt group .....	LI Nian, REN Feixiang, CHEN Puhui, YE Qiang, SUN Yanpeng (176)
Load bearing capability of thread teeth of C/SiC composite bolts .....	LU Zixing, LIAO Qiang, YANG Zhenyu, FENG Xiang, ZHANG Zhongwei, FENG Zhihai (182)
Effects of mechanics and interface parameters and volume fraction of shape memory alloys on toughening of bulk metallic matrix glass composites .....	ZHANG Ruyuan, KAN Qianhua, ZHANG Juan, KANG Guozheng (188)
Impact tests and numerical simulation of composite waved-beam .....	MENG Xiangji, YAN Ying, LUO Haibo, HOU Kang, LIANG Zudian, GONG Shaobo (196)
Experimental-numerical hybrid method for measurement of cohesive zone model parameters of short fiber composites in both macro and micro scale .....	SHEN Min, ZHANG Xiaoxu, SUN Xiaoxiang (204)
Effects of structural corner on permeability of fiber preform in VIMP .....	ZHONG Yong, XIAO Jiayu, YIN Dulin, YANG Jinshui (217)
Scanning imaging of composite plate using air-coupled Lamb waves based on probabilistic damage algorithm .....	LIU Zenghua, FAN Junwei, HE Cunfu, WU Bin (227)
Ply optimization of composite laminate with ply drop based on genetic algorithm .....	JIN Dafeng, LIU Zhe, FAN Zhirui (236)
Energy absorption mechanism of circular-square irregular section composite tubes .....	MA Yan, YANG Yuqiu (243)
Experiment and electrical-thermal coupled simulation for lightning current damage of carbon fiber reinforced plastic .....	FU Shangchen, ZHOU Yinghui, SHI Lihua, SI Qing, WANG Dong, XU Jifeng (250)
Effects of different hand-made preparation methods on quality of prepreg radius fillers .....	HUANG Binyao, XIONG Meirong, DUAN Yuixin (260)
Adsorption characteristics and mechanism of hydroxyethyl cellulose/sodium alginate blend films for uranium (VI) .....	XIE Shibo, LUO Jingyang, LIU Qing, LING Hui, DUAN Yi, WANG Jinsong (268)
An analytical solution for periodic multi-phase fibrous piezoelectric composites under antiplane deformation .....	XU Yaoling, XIAO Junhua, QIU Pengkai (276)
Damage zoning characteristics of composite laminates with different protections subjected to lightning strike .....	LIU Zhiqiang, YUE Zhufeng, WANG Fusheng, JI Yaoyao (284)
Numerical simulation and test on stability of composite grid stiffened cylinder .....	YANG Yanzhi, ZHENG Quan, LI Hao, LYU Rongxin, WANG Ruifeng (295)

## 欢迎订阅《复合材料学报》

《复合材料学报》(双月刊)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,2008年被评选为“中国精品科技期刊”,2009年度入选“百种中国杰出学术期刊”,2012年入选“中国最具国际影响力学术期刊”(TOP5%,共175种学术期刊)。目前,本刊已有3篇论文入选“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》的核心检索收录刊;也是美国化学文摘《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》等国际检索系统用刊。

《复合材料学报》国内外公开发行,邮发代号:80-413

刊号:ISSN 1000-3851; CN 11-1801/TB

每期定价80元,全年定价480元

## 复合材料学报

Fuhe Cailiao Xuebao 双月刊,1984年创刊

第32卷 第1期 2015年2月出版

Bimonthly, Started in 1984

Vol. 32 No. 1 February 2015

主管单位:工业和信息化部

Administred by Ministry of Industry and Information

主办单位:北京航空航天大学

Technology of the People's Republic of China

中国复合材料学会

Sponsored by Beihang University (BUAA)

主编:益小苏

Chinese Society for Composite Materials

学术编辑:复合材料学报 编辑部

Chief Editor: Prof. Yi Xiaosu

Academically Edited by Editorial Office of

北京海淀区学院路37号,100191

37 Xueyuan Road, Haidian District, Beijing 100191, China

电 话:(010) 82316907(5973)

Tel: 0086-10-82316907(5973)

编辑出版:北航文化传媒集团

Edited and Published by BUAA Culture Media Group Ltd.

网 址:<http://fhclxb.buaa.edu.cn>

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

印 刷:北京科信印刷有限公司

Printed by Beijing Kexin Printing Co., Ltd

发 行:北京报刊发行局

Distributed by Beijing Bureau for Distribution of

发行范围:国内外公开发行

Newspapers and Journals

刊 号: ISSN 1000-3851 (国际标准刊号)  
CN 11-1801/TB (国内统一刊号)

ISSN 1000-3851

国内定价:80.00元 邮发代号:80-413

