

# 目 次



## 工程塑料应用

月刊 · 公开发行 · 1973 年创刊

第 46 卷, 第 5 期

(总第 343 期)

2018 年 5 月 10 日出版

### 材料与应用

- 端氨基丁腈橡胶与纳米  $\text{SiO}_2$  粒子增韧环氧树脂性能 ..... 卢亚汝, 张森, 刘源仁, 等 (1)  
插层改性膨润土对聚合物基摩擦材料摩擦性能的影响 ..... 马原野, 王占红, 侯贵华, 等 (6)  
多形貌聚醚砜纤维毡吸附双酚 A 的特性 ..... 魏晓慧, 刘锋, 郝丽梅, 等 (12)  
石蜡油、环烷油填充 SEBS / PBT 共混物性能对比 ..... 邓益祺, 严岿, 姜旭, 等 (18)  
高温高湿环境下紫外老化对氨纶结构及性能的影响 ..... 游革新, 钟艳萍, 肖泽润, 等 (23)  
POE / PPR 制备非 PVC 输液袋外层与中间层 ..... 张珂珂, 魏芳, 李浩, 等 (28)  
组分对 PA6 / PP / 滑石粉三元复合材料的影响 ..... 陈晓东, 陈光伟 (33)  
多壁碳纳米管在国产碳纤维增强环氧树脂复合材料中应用 ..... 郑志才, 王尚, 田雅萍, 等 (38)

### 加 工

- 基于分子动力学模拟的环氧 / 多层石墨烯界面拉伸性能 ..... 郭志婧, 刘伟帅, 曹晓雪 (42)  
聚氨酯支撑结构免充气轮胎仿真模拟与优化 ..... 王文峰, 雍占福, 王裕成, 等 (48)  
高过载条件下 CFRP 壳体演化行为的数值模拟 ..... 王荣惠, 李树虎, 陈以蔚, 等 (52)  
有限元分析在 ABS 控制面板模具设计中的应用 ..... 关兴举, 张海波 (57)  
夹芯复合材料力学性能分析方法对比 ..... 周正亮, 陈同海, 张守玉, 等 (63)  
注塑工艺对哑光 PC / ABS 冲击性能的影响 ..... 肖亮, 咸天银, 柏莲桂, 等 (68)

### 机械与模具

- 基于拉格朗日的单螺杆销钉挤出机混沌混合分析 ..... 李飞, 朱向哲, 刘俭 (72)  
基于 CAE 技术的翘曲分析及反变形补偿设计 ..... 王秀梅, 翟豪瑞 (77)

### 测试与老化

- 气炮加载下 PBXs 替代材料中的应力波幅衰减特性 ..... 黄韬, 陈建康, 李克武, 等 (81)  
树脂基复合材料中碳纤维分散均匀性的图像表征 ..... 钟强, 安瑛, 余韶阳, 等 (85)  
高流动抗冲聚丙烯 2240S 及对比牌号结构与性能 ..... 焦旗, 郑鹏程, 王居兰, 等 (89)  
尼龙 12 / 氧化石墨烯纳米复合粉末的制备及性能 ..... 谭支林, 汪艳 (93)  
两种共聚聚丙烯 PPH-M12N 流变性能的对比 ..... 李伟, 崔梦杰, 张云奎, 等 (98)  
基于拉伸流变挤出的马来酸酐接枝聚丙烯性能 ..... 刘嘉贤, 王明辉, 唐舫成, 等 (103)

### 填料与助剂

- 碳纳米管改性 PTFE 复合材料摩擦磨损性能 ..... 李朋辉, 侯根良, 毕松, 等 (108)  
玻璃微珠 / 固体润滑剂改性 PA6 的力学和摩擦学性能 ..... 游一兰, 李笃信, 刘士军, 等 (113)  
PBT / 碱硼基空心玻璃微珠复合材料的制备及性能 ..... 冯建林 (117)

### 综 述

- 金属 - 塑料一体化成型技术金属前处理方法研究进展 ..... 李查, 陈静, 李又兵, 等 (121)  
聚丙烯微孔发泡材料制备及改性进展 ..... 眭晓龙 (125)  
仿生织构对材料表面的摩擦学性能影响研究现状与展望 ..... 文怀兴, 任锐锐, 宋浩杰 (130)

主 管 中国兵器工业集团公司  
主 办 中国兵器工业集团第五三研究所  
中国兵工学会非金属专业委员会  
兵器工业非金属材料专业情报网

编辑·出版《工程塑料应用》杂志社

社长·主编 王金立

执行主编 张振

通讯地址 济南市天桥区田庄东路 3 号

邮政编码 250031

电 话 编 辑 部: 0531-85878057

广 告 部: 0531-85878220

发 行 部: 0531-85878223

网络光盘部: 0531-85878224

传 真 0531-85947355

电子信箱 5947355@163.com

epa@epa1973.com

网 址 www.epa1973.com

排 版 本刊杂志社

印 刷 济南继东彩艺印刷有限公司

国内发行 济南市邮政局

邮发代号 24-42

国外发行 中国国际图书贸易总公司  
(北京 399 信箱 100044)

国外发行代号 4503 MO

国内统一刊号 CN 37-1111 / TQ

国际标准刊号 ISSN 1001-3539

广告经营许可证号 3700004000047

全国各地邮局均可订阅 每册定价 15 元  
本刊杂志社办理订阅

本期责任编辑 王喜梅, 赵志鸿, 栾维涛



**ENGINEERING  
PLASTICS  
APPLICATION**

(EPA)

Monthly

(Started Publication in 1973)

Vol.46, No.5, 2018

(Series No.343)

Published on May 10, 2018

**Superintended by**

China North Industries Group Corporation

**Sponsored by**

CNGC Institute 53, etc.

**Editor & Publisher**

The Magazine House of  
ENGINEERING PLASTICS APPLICATION

**Director & Chief Editor** Wang Jinli

**Executive Chief Editor** Zhang Zhen

**Add** No.3 Tianzhuang East Road, Tianqiao  
District, Jinan, China

**Postcode** 250031

**Tel** +86 531 85878057 85878224  
85878220 85878223

**Fax** +86 531 85947355

**E-mail** 5947355@163.com  
epa@epa1973.com

**Website** www.epa1973.com

**Distributor Abroad**

China International Book Trading Corporation  
(P.O. Box 399, Beijing 100044, China)

**Distributing Code Abroad** 4503 MO

**Unified Number of Print**

ISSN 1001-3539  
CN 37-1111/TQ

**Wang Ximei**

**Duty Editor** Zhao Zhihong  
Luan Weitao

# Main Contents

## Materials & Applications

- Performance of Modified Epoxy Resin with Amine Liquid NBR and Nano SiO<sub>2</sub>.....  
.....*Lu Yaru, Zhang Sen, Liu Yuanren, et al.(1)*
- Effect of Intercalated Modified Bentonite on Tribology Properties of Polymer Matrix Friction Materials.....*Ma Yuanye, Wang Zhanhong, Hou Guihua, et al.(6)*
- Characteristic of Hierarchical Nanofiber Mats of Electrospun Polyethersulfone for Removing Bisphenol A.....*Wei Xiaohui, Liu Duo, Hao Limei, et al.(12)*
- Properties Comparison of SEBS / PBT Blends Filled with Paraffinic Oil and Naphthenic Oil .....*Deng Yiqi, Yan Kui, Jiang Xu, et al.(18)*
- Influence of UV-aging on Structure and Properties of Spandex under High Temperature and Humidity.....*You Gexin, Zhong Yanping, Xiao Zerun, et al.(23)*

- POE / PPR Preparation of Non-PVC Infusion Bag Outer Layer and Middle Layer.....  
.....*Zhang Yake, Wei Fang, Li Hao, et al.(28)*

- Effect of Composition on PA6 / PP / Talc Composite.....*Chen Xiaodong, Chen Guangwei(33)*
- Application of Multi-walled Carbon Nanotubes in Domestic Epoxy Resin / Carbon Fiber Composites.....*Zheng Zhicai, Wang Shang, Tian Yaping, et al.(38)*

## Process Technology

- Interfacial Tensile Properties of Epoxy / Multilayer Graphene Based on Molecular Dynamics Simulation.....*Guo Zhijing, Liu Weishuai, Cao Xiaoxue(42)*
- Simulation and Optimization of Non-pneumatic Tire with Polyurethane Support Structure.....  
.....*Wang Wenfeng, Yong Zhanfu, Wang Yucheng, et al.(48)*
- Numerical Simulation for Evolutive Process of CFRP Shell under Condition of High Overload .....  
.....*Wang Ronghui, Li Shuhu, Chen Ywei, et al.(52)*
- Application of Finite Element Analysis in ABS Control Panel Mold Design.....  
.....*Guan XingJu, Zhang Haibo(57)*
- Comparative Analysis of Mechanical Properties of Sandwich Composites.....  
.....*Zhou Zhengliang, Chen Tonghai, Zhang Shouyu, et al.(63)*
- Influence of Injection Molding Process on Impact Strength of Matt PC / ABS.....  
.....*Xiao Liang, Qi Tianyin, Bai Liangui, et al.(68)*

## Machinery & Moulds

- Chaotic Mixing Analysis of Single Screw Extruder Based on Lagrangian Viewpoint.....  
.....*Li Fei, Zhu Xiangzhe, Liu Jian(72)*
- Warpage Analysis and Anti-deformation Compensation Design Based on CAE Technology.....  
.....*Wang Xiumei, Zhai Haorui(77)*

## Analysis & Ageing

- Attenuation Characteristics of Stress Amplitude in PBXs Substitute Materials under Air Gun Loading.....*Huang Tao, Chen Jiankang, Li Kewu, et al.(81)*
- Image Representations of Carbon Fiber Uniformity in Resin Composites.....  
.....*Zhong Qiang, An Ying, Yu Shaoyang, et al.(85)*
- Structure and Properties of High Flow Impact Polypropylene 2240S and Its Comparative Grade Samples.....*Jiao Qi, Zheng Pengcheng, Wang Julian, et al.(89)*
- Preparation and Performance of PA12 / Graphene Oxide Nanocomposites.....  
.....*Tan Zhilin, Wang Yan(93)*
- Comparison of Rheological Properties of Two Copolymers of Polypropylene PPH-M12N .....  
.....*Li Wei, Cui Mengjie, Zhang Yunkui, et al.(98)*
- Properties of Polypropylene-Graft-Maleic Anhydride Based on Tensile Rheology Extrusion .....  
.....*Liu Jiaxian, Wang Minghui, Tang Fangcheng, et al.(103)*

## Fillers & Additives

- Friction and Wear Properties of PTFE Composites Filled with CNTs.....  
.....*Li Penghui, Hou Genliang, Bi Song, et al. (108)*
- Mechanical and Tribological Properties of Polyamide 6 Modified by Glass Bead and Solid Lubricant.....  
.....*You Yilan, Li Duxin, Liu Shijun, et al.(113)*
- Preparation and Properties of PBT / Soda-lime Borosilicate GlassBeads Composites .....  
.....*Feng Jianlin(117)*

## Summary

- Research Progress of Metal Pretreatment Methods in Metal –Plastic Integrated Molding Technology.....*Li Cha, Chen Jing, Li Youbing, et al.(121)*
- Progress of Preparation and Modification of Microcellular Polypropylene Foam.....*Sui Xiaolong(125)*
- Current Situation and Prospect of Study on Effect of Surface Texture on Tribological Properties of Materials.....*Wen Huaxing, Ren Ruirui, Song Haojie(130)*