

# 目 次

## 材料与应用

- 低含量增塑剂 PEG 对 PLA 性能的影响·····朱艳,张显勇,贾仕奎,等(1)
- PEG-HA-PAA 多孔型高吸水树脂的制备及性能·····李鑫,牛育华,赵冬冬(7)
- 聚乳酸/纳米羟基磷灰石/脱胶蚕丝纤维多孔支架的制备与性能·····  
·····刘晓南,张道海,李刚,等(14)
- r-PE-HD/r-PET 纤维复合材料的制备与性能·····阮文灵,毛亚鹏,李秋影,等(21)
- 石墨烯-硅藻土改性 PP 复合材料的导电性能与力学性能·····武卫莉,李响,陈丰雨(27)
- OMMT 对 PP/IFR/OMMT 复合材料性能的影响·····田琴,罗继勇,张道海,等(32)
- 汽车内饰用聚丙烯复合材料的制备与性能·····俞飞,陈嘉杰,李振华,等(37)
- 不同树脂配比的 GF 增强 PBT/PET 复合材料体系性能·····李登辉,张宜鹏,马清云(44)

## 加 工

- 基于工艺参数在线监测的聚乳酸生物塑料注射成型机理·····陈金伟,郑海仪,梁钊发,等(50)
- PE-LD/PE-UHMW 复合材料的制备工艺及拉伸性能·····杜增锋,王旭,郑宏亮,等(56)
- 连续玻纤增强 PP 复合 PET 泡沫夹芯板的模压成型工艺·····袁杰,李丽,徐光磊,等(61)
- 汽车注塑产品成型过程数字化监控系统构建及应用·····张辉,李杰,杨伟(66)

## 机械与模具

- 螺杆挤出式 3D 打印成型设备喷头设计及温度场数值模拟·····秦望,白海清,贾仕奎,等(73)
- 气缸感应开关壳体注塑模具设计·····黄继战,陈炜,范玉(79)
- 基于 CAX 的电饭煲注塑模具设计与数控加工·····程美(86)
- 基于 Rhino 造型的口部螺纹花瓶瓶吹塑成型设计·····吴冬俊,周小军,梁莉,等(91)
- 喷油器顶盖半圆翻转抽芯机构模具设计·····马振锋,刘胜永,韦敏(97)

## 测试与老化

- 铝颜料对免喷涂聚丙烯热老化变色的影响·····卢朝亮,付大炯,苏娟霞,等(101)
- 矿粉填充聚丙烯的耐刮擦性能影响因素·····王怡博,邵景昌,邵琦(106)
- PANI/TiO<sub>2</sub> 复合膜的制备及其气敏响应·····朱涛,常燕,段力峰,等(110)
- 基于系统工程的民机复材部件适航符合性验证测试技术及应用·····孟祥敏(115)

## 填料与助剂

- 成核剂癸二酸二苯基二酰肼的合成及对 PP 结晶熔融行为的影响·····  
·····张跃飞,贺哲,毛静静,等(121)
- 新型阻燃剂 MPAP 的合成及其协同阻燃 GFPA66 的性能·····吕强(125)
- 酞菁蓝母粒对 PPS 原液着色纤维性能影响·····武艳杰,乔辉,丁筠,等(129)
- 废弃 PCB 非金属材料的回收处理及高值化利用·····郑夏莲,马元好,郑明春(134)

## 综 述

- 石墨烯在塑料改性领域中的应用·····邓智鹏,郝雅鸣,陈丹青,等(139)
- 生物可降解碳水化合物嵌入式聚氨酯材料的研究进展·····于玛丽,李丽梅,李庆,等(145)
- 生物降解地膜材料的研究进展·····丁茜,余佳,蒋馨漫,等(150)
- 改性石油树脂对塑料改性研究进展·····李爱元(154)



# 工程塑料应用

月刊·公开发行·1973年创刊

第 47 卷,第 12 期  
(总第 362 期)

2019 年 12 月 10 日出版

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 epa@epa1973.com

网 址 www.epa1973.com

www.epa1973.net

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 20 元

本刊杂志社办理订阅

本期责任编辑 吕召胜,谈桂春,栾维涛



**ENGINEERING  
PLASTICS  
APPLICATION  
(EPA)**

Monthly

(Started Publication in 1973)

Vol.47, No.12, 2019

(Series No.362)

Published on Dec. 10, 2019

**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** epa@epa1973.com

**Website** www.epa1973.com  
www.epa1973.net

**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

**Duty Editor** **Lyu Zhaosheng**  
**Tan Guichun**  
**Luan Weitao**

# Main Contents

## Materials & Applications

- Effects of Low Content Plasticizer PEG on PLA Performances.....  
.....*Zhu Yan, Zhang Xianyong, Jia Shikui, et al*(1)
- Preparation and Properties of PEG-HA-PAA Superabsorbent Resin with Porous Structure.....  
.....*Li Xin, Niu Yuhua, Zhao Dongdong*(7)
- Preparation and Properties of PLA / nHA / DSF Porous Scaffolds.....  
.....*Liu Xiaonan, Zhang Daohai, Li Gang, et al*(14)
- Preparation and Properties of r-PE-HD / r-PET Fiber Composites.....  
.....*Nguyen Van-linh, Mao Yapeng, Li Qiuying, et al*(21)
- Conductivity and Mechanical Properties of Graphene-Diatomite Modified Polypropylene Composites.....  
.....*Wu Weili, Li Xiang, Chen Fengyu*(27)
- Effects of OMMT on Properties of PP / IFR / OMMT Composites.....  
.....*Tian Qin, Luo Jiyong, Zhang Daohai, et al*(32)
- Preparation and Properties of Polypropylene Composites for Automotive Interiors.....  
.....*Yu Fei, Chen Jiajie, Li Zhenhua, et al*(37)
- Performances of GF Reinforced PBT / PET Composites with Different Resin Ratios.....  
.....*Li Denghui, Zhang Yipeng, Ma Qingyun*(44)

## Process Technology

- Injection Molding Mechanism of PLA Bioplastics Based on Online Monitoring of Processing Parameters.....  
.....*Chen Jinwei, Zheng Haiyi, Liang Zhaofa, et al*(50)
- Preparation Process and Tensile Properties of PE-LD / PE-UHMW Composites.....  
.....*Du Zengfeng, Wang Xu, Zheng Hongliang, et al*(56)
- Compression Molding Process for Continuous Glass Fiber Reinforced PP Composite PET Foam Sandwich Panel.....  
.....*Yuan Jie, Li Li, Xu Guanglei, et al*(61)
- Construction and Application of Digital Monitoring System in Molding Process of Automobile Injection Molding Products.....  
.....*Zhang Hui, Li Jie, Yang Wei*(66)

## Machinery & Moulds

- Nozzle Structure Design of Screw Extrusion Type 3D Printing Molding Equipment and Numerical Simulation Analysis of Temperature Field.....  
.....*Qin Wang, Bai Haiqing, Jia Shikui, et al*(73)
- Design of Injection Mould for Cylinder Induction Switch Shell.....  
.....*Huang Jizhan, Chen Wei, Fan Yu*(79)
- Design and NC Machining of Injection Mould for Electric Rice Cooker Based on CAX.....  
.....*Cheng Mei*(86)
- Design of Injection-Stretch-Blow Molding for Floral Bottle with Mouth Thread Based on Rhino Modeling.....  
.....*Wu Dongjun, Zhou Xiaojun, Liang Li, et al*(91)
- Design of Mould with Semi-circle Reversal Core-pulling Mechanism for Fuel Injector Top Cover.....  
.....*Ma Zhenfeng, Liu Shengyong, Wei Min*(97)

## Analysis & Ageing

- Effect of Aluminum Pigment on Thermal Aging and Discoloration of Spray-Free Polypropylene.....  
.....*Lu Chaoliang, Fu Dajiong, Su Juanxia, et al*(101)
- Influence Factors of Scratch Resistance of Mineral Powders Filled Polypropylene.....  
.....*Wang Yibo, Shao Jingchang, Shao Qi*(106)
- Preparation of PANI / TiO<sub>2</sub> Composite Membrane and Its Gas-sensing Behavior.....  
.....*Zhu Tao, Chang Yan, Duan Lifeng, et al*(110)
- Airworthiness Compliance Verification Testing Technology of Civil Aircraft Composite Parts Based on System Engineering.....  
.....*Meng Xiangmin*(115)

## Fillers & Additives

- Synthesis of *N, N'*-bis(benzoyl) Sebacic Acid Dihydrazide and Its Effects on Crystallization and Melting Behaviors of Polypropylene.....  
.....*Zhang Yuefei, He Zhe, Mao Jingjing, et al*(121)
- Synthesis of a Novel Halogen-Free Flame Retardant MPAP and Its Performance on Synergistic Flame-Retarded Glass Fiber Reinforced PA66.....  
.....*Lyu Qiang*(125)
- Effect of Phthalocyanine Blue Masterbatch on Properties of Dope Dyeing PPS Fiber.....  
.....*Wu Yanjie, Qiao Hui, Ding Yun, et al*(129)
- Recovery Processing and Higher Value Application of Waste PCB Non-Metallic Materials.....  
.....*Zheng Xialian, Ma Yuanhao, Zheng Mingchun*(134)

## Summary

- Application of Graphene in the Field of Plastics Modification.....  
.....*Deng Zhipeng, Hao Yaming, Chen Danqing, et al*(139)
- Research Progress on Carbohydrates Embedded Polyurethane Biodegradable Materials.....  
.....*Yu Mali, Li Limei, Li Qing, et al*(145)
- Research Progress on Biodegradable Mulching Film Materials.....  
.....*Ding Qian, Yu Jia, Jiang Xinman, et al*(150)
- Research Progress in Modification of Plastics by Modified Petroleum Resin.....  
.....*Li Aiyuan*(154)