宁波市科学技术奖公示信息表（单位提名）

提名奖项：宁波市科技进步奖

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| 成果名称 | 微膨胀阻燃材料 |
| 提名等级 | 一等奖 |
| **提名书****相关内容** | 专利及知识产权：1. 朱红芳，李娟，许亮。一种阻燃添加剂的制备方法。中国发明专利，ZL201110101980.0，授权公告日：2014年5月7日
2. 李娟，王鑫君。一种含有三维结构阻燃剂的环保型阻燃聚丙烯复合材料，中国发明专利，ZL201810797823.X，授权公告日：2020年12月1日

代表性论文：1. Juan Li, Chenhao Ke, Liang Xu, Xinyu Fan, Yuzhong Wang. Synergistic effect between a hyperbranched charring agent and ammonium polyphosphate on the intumescent flame retardant acrylonitrile-butadiene-styrene. *Polymer Degradation and Stablility*, 2012, 97, 1107-1113.
2. Siqi Huo, Pingan Song, Bin Yu, Shiya Ran, Venkata S. Chevali, Lei Liu, Zhengping Fang, Hao Wang, Phosphorus-containing flame retardant epoxy thermosets: Recent Advances and Future Perspectives. *Progress in Polymer Science*, 2021, 114, 101366.
3. Shuang Yang, Siqi Huo, Jun Wang, Bin Zhang, Jingsheng Wang, Shiya Ran, Zhengping Fang, Pingan Song, Hao Wang. A highly fire-safe and smoke-suppressive single-component epoxy resin with switchable curing temperature and rapid curing rate. *Composites Part B: Engineering*, 2021, 207, 108601.
4. Chenhao Ke, Juan Li, Keyi Fang, Qiliang Zhu, Jin Zhu, Qing Yan, Yuzhong Wang. Synergistic effect between a novel hyperbranched charring agent and ammonium polyphosphate on the flame retardant and anti-dripping properties of polylactide. *Polymer Degradation and Stablility*, 2010, 95, 763-770.
5. Siqi Huo, Zhongxiao Zhou, Jiawei Jiang, Ting Sai, Shiya Ran, Zhengping Fang, Pingan Song, Hao Wang, Flame-retardant, transparent, mechanically-strong and tough epoxy resin enabled by high-efficiency multifunctional boron-based polyphosphonamide. *Chemical Engineering Journal*, 2022, 427, 131578.
6. Hongfang Zhu, Qiliang Zhu, Juan Li, Kang Tao, Lixin Xue, Qing Yan. Synergistic Effect between Expandable Graphite and Ammonium Polyphosphate on Flame Retarded Polylactide. *Polymer Degradation and Stablility*, 2011, 96, 183-189.
7. Siqi Huo, Ting Sai, Shiya Ran, Zhenghong Guo, Zhengping Fang, Pingan Song, Hao Wang, A hyperbranched P/N/B-containing oligomer as multifunctional flame retardant for epoxy resins. *Composites Part B: Engineering*, 2022, 234, 109701.
8. Kang Tao, Juan Li, Liang Xu; Xiulan Zhao; Lixin Xue; Xinyu Fan; Qing Yan. A novel phosphazene cyclomatrix network polymer: design, synthesis and application in flame retardant polylactide. *Polymer Degradation and Stablility*, 2011, 96,1248-1254.
9. Shengjiao Chen, Juan Li, Yingke Zhu, Zibin Guo, Shengpei Su. Increasing the efficiency of intumescent flame retardant polypropylene catalyzed by polyoxometalate based ionic liquid. *Journal of Materials Chemistry A*, 2013, 1 (48), 15242-15246.
10. Jinhao Sun, Lu Li, Juan Li. Effects of furan-phosphamide derivative on flame retardancy and crystallization behaviours of poly(lactic acid). *Chemical Engineering Journal*, 2019, 369, 150-160.
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| 提名单位 | 浙大宁波理工学院 |
| 提名意见 | 针对阻燃效率低造成力学性能损失的问题，项目从宏观阻燃机理出发，提出微膨胀阻燃的概念，设计了催化、成炭、协同、杂化等途径调控炭层微结构，使材料在燃烧过程中形成微孔炭结构，改善炭层质量和阻燃效率，在获得高效阻燃的同时，实现强韧化。对开发性能与功能的一体化的阻燃材料具有重要的意义，为电子电器、交通运输、新能源等产业提供火安全策略。提名该项目为市科学技术进步奖 一 等奖。 |