

Science Bridges China Research Profile

Name: Professor Shaoyun Guo
Position:
Institute/division: Polymer Research Institute
State Key Lab of Polymer Materials Engineering , Sichuan University
Email: nic7702@scu.edu.cn
Tel: 8628-85405135



SUMMARY OF MY RELEVANT RESEARCH AREAS:

Polymer Mechanochemistry, Morphology & Structure Development of Polymer, blends and composites, during Polymer Processing

聚合物机械化学;在聚合物加工过程聚合物, 中混物及复合材料的形态和结构开发。

Primary Research interests:

Prof. Shaoyun Guo completed his PhD in Polymer Science at Sichuan University, became a professor of Sichuan University in 1996. He worked as Senior Visiting Professor at Laval University, Canada. For the last 12 years he has been working in the broad field of Polymer Mechanochemistry and polymer processing in collaboration with international industry and other academic institutions.

Since 1993, he has conducted more than 30 research projects supported by the Government Agencies and Industries. Ultrasound-extrusion equipment for polymer processing was developed in our lab. The effects of ultrasonic oscillations on structure development, mechano-chemical reaction, and change in properties and morphologies of the polymers were studied. In presence of ultrasonic oscillations, polymers may be processed at mild conditions, and the mechanical properties of the polymer materials will be enhanced. His present research work is focusing on ultrasound initiated melt grafting reaction of MAH or other monomers onto polyolefin elastomers or plastomers.

Stress induced activation and degradation of PVC during vibromilling and jet milling were systematically studied. PVC with low molecular weight and low crystallinity was prepared by mechano-chemical method, which is difficultly synthesized by traditional methods. The mechanism for mechano-chemically degraded PVC plasticizing PVC was investigated. Innovative processing aid of PVC-MC100 was successfully developed to improve the processibility, mechanical properties and thermal stability of PVC. Under financial support from National high-tech R&D Program and National Key Technologies R&D Program, his present research work is focusing on preparation of high performance low cost polyvinyl chloride chemical building materials.

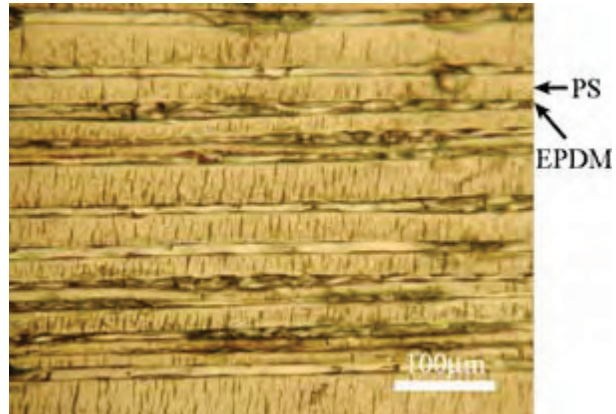
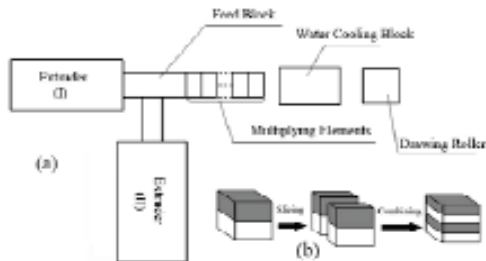
In addition, his research work is recently focusing on morphology & structure development of polymer, blends and composites during microlayer coextrusion. (2 projects funded by National Natural Science Foundation of China)

Topics in which you would like to develop collaborative research:

- **ultrasound assisted processing; structuring of polymers and nanocomposites by processing**

Relevant existing collaborations (academic/clinical/commercial) inside or outside China.

Relevant graphics, figures, pictures:



Publications and other outputs relevant to your interest in this programme

1. Static ultrasonic oscillations induced degradation and its effect on the linear rheological behavior of novel propylene based elastomer melts, Bo Peng, Hong Wu, Shaoyun Guo, Shih-Yaw Lai and Jinder Jow, *Polymer Degradation and Stability*, 2007, 92(8), 1632-1639.
2. Ultrasonic oscillations induced morphology and property development of polypropylene/montmorillonite nanocomposites, Zhao Lijuan, Li Jiang, Guo Shaoyun, Du Qin, *Polymer*, 2006, 47(7), 2460-2469.
3. In Situ Compatibilization of PS/EPDM Blends during Ultrasonic Extrusion, Jiang Li, Shaoyun Guo, Radek Sleza'k, Berenika Hausnerova, *Macromolecular Chemistry and Physics* 2005, 206(24), 2429 – 2439.
4. Mechanochemical degradation kinetics of high-density polyethylene melt and its mechanism in the presence of ultrasonic irradiation, Yuntao Li, Jiang Li, Shaoyun Guo, Huilin Li, *Ultrasonics Sonochemistry*, 12(3), 183-189, 2005.
5. A modified model predictions and experimental results of weld-line strength in injection molded PS/PMMA blends, Shaoyun Guo, A. Ait-Kadi, M. Bousmina, *Polymer*, 45(9), 2911-2920, 2004.