

Science Bridges China Research Profile

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SUMMARY OF MY RELEVANT RESEARCH AREAS:

Polymer blends and composites, New technology for preparation and processing of polymer materials

高分子共混复合材料，高分子制备加工新技术

Primary Research interests:

1. POM/PEO blends with enhanced impact strength, lubrication and wear properties, an interesting crystalline/crystalline system, were prepared by controlling the multi-scale crystalline structure through changing the content of components, the temperature and stress during processing.
2. Inorganic fillers such as silica, graphite etc. were blended with POM/PEO composite to improve their mechanical, lubrication and wear properties of POM/PEO blend were further improved.
3. The structures of POM/PEO and POM/PEO/inorganic filler systems under micro injection molding were investigated, which can be used to make micro gears.

Topics in which you would like to develop collaborative research:

Micro injection molding of polymer composite and application of POM/PEO composite in micro injection molding.

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

Include here any relevant collaborations you have

Collaboration with polymer IRC at University of Bradford in polymer micro-processing

Relevant graphics, figures, pictures:

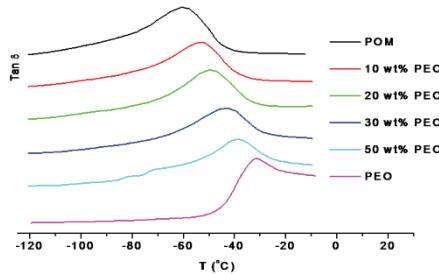
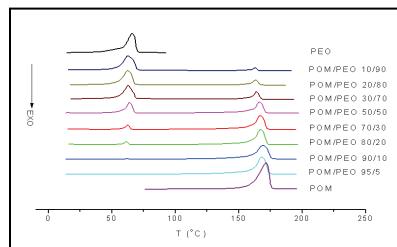
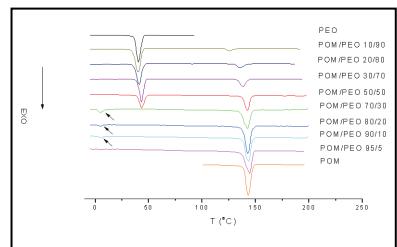


Fig.1 DMA curves of POM, PEO and POM/PEO blends



Cooling curves



heating curves

Fig.2 DSC curves of neat POM, PEO and their blends containing 5-90 wt% PEO

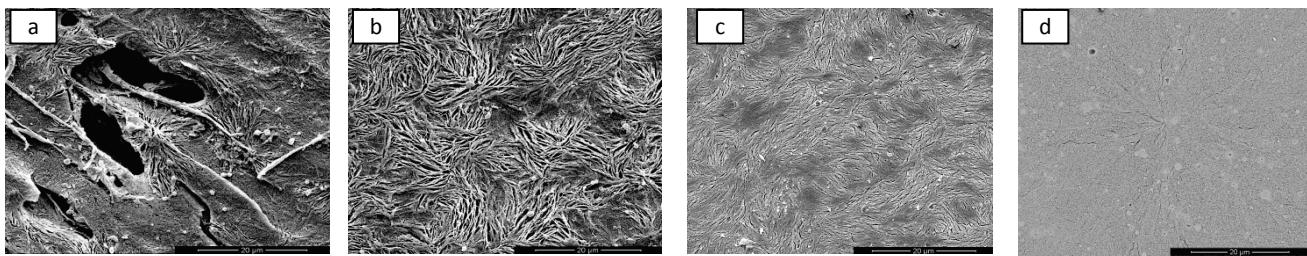


Fig.3 SEM photos of POM/PEO blends containing different PEO content eroded by water to remove PEO (a, POM/PEO:30/70, b, POM/PEO:70/30, c, POM/PEO:90/10, d, POM/PEO:95/5)

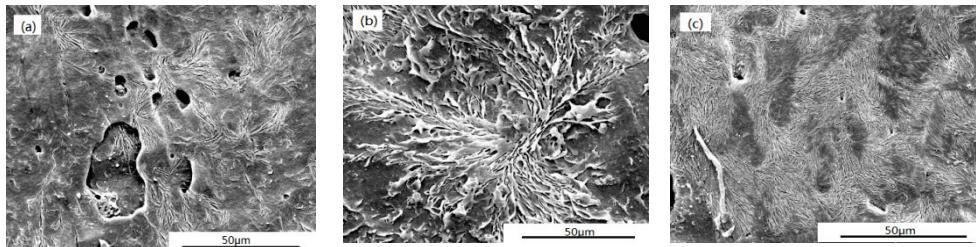


Fig.4 SEM photos of POM/PEO blend (90/10) prepared at injection speeds of 5mm/s (a), 50mm/s (b) and 120mm/s (c) and eroded by water to remove PEO.

Publications and other outputs relevant to your interest in this programme (up to 5)

1. Bai S.B., Liu J.L., Wang Q. Polymer Material Science and Engineering 2007, 23, 136-139.
2. Bai S. B., Wang Q. Polymer Engineering and Science, 2012, 3, 763-767.
3. Jiao Z.Q., Bai S. B., Wang Q. Plastics 2010, 39, 65-68.
4. Liu X., Bai S. B., Wang Q. Journal of Macromolecular Science, Part B: Physics, 2012, 51, 1–12.
5. Liu X., Bai S. B., Wang Q. Journal of Polymer Research, 2012, 19, 9787-9933.