国家复合改性聚合物材料工程技术研究中心
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基于微纳层叠共挤出技术制备原位微纤增强弹性体材料

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摘要:

通过微纳层叠共挤设备成功制备了POE、EVA基原位微纤复合材料，提高了材料的力学性能、流变性能等。为制备高性能的弹性体材料提供一种新方法。

简介:

聚合物微纳层叠共挤技术作为近年发展的前沿共挤技术，在制备光学材料、高阻隔材料、介电材料等方面具有独特优势。微纳层叠共挤设备中倍增器可提供强大的剪切力，分散相能更好的在基体中“原位”形成微纤。

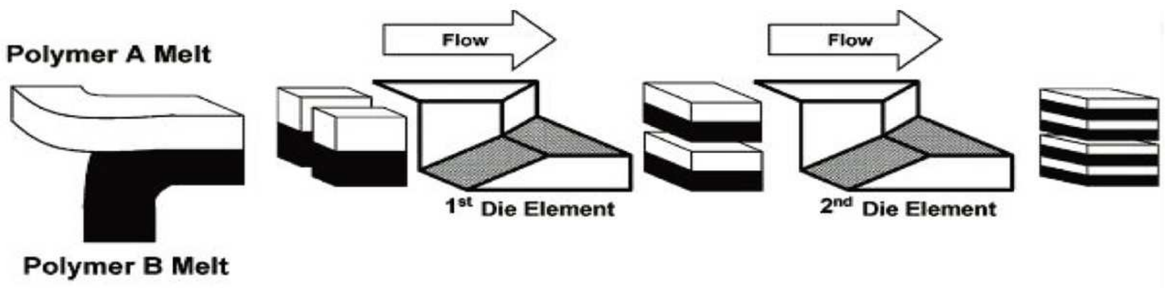

Figure 1 Schematic showing the polymer melt flow process in the laminating-multiplying elements (LMEs)

Figure 2 Schematic of multistage stretching extrusion system.

实验:

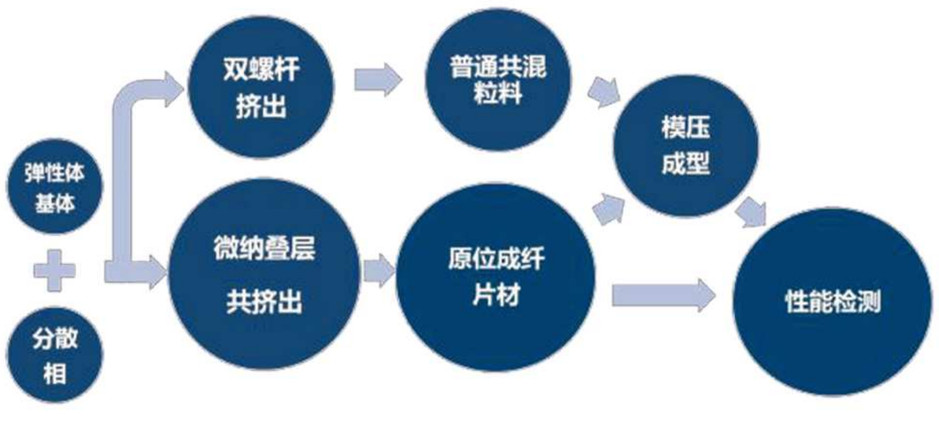

Figure 3 Flow chart for preparing the in-situ microfibrillar composite (MFCs)

结果与讨论:

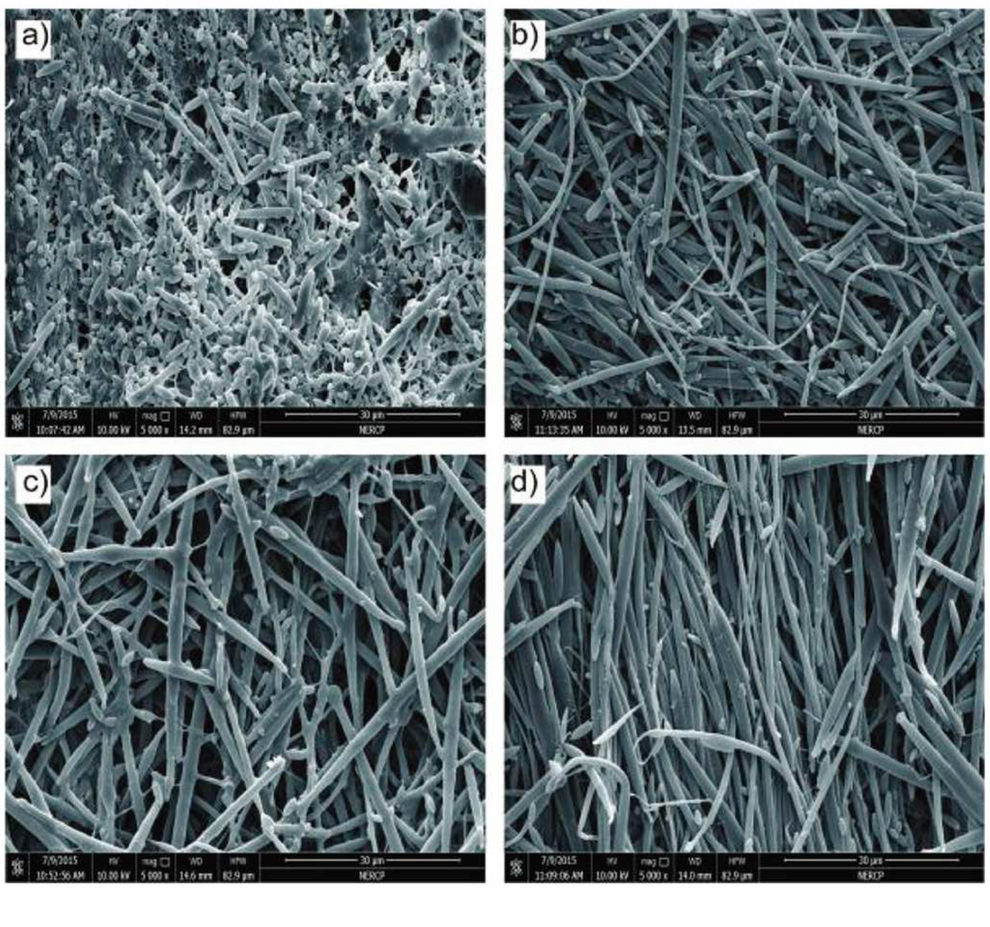

Figure 4 the morphology of the PTT microfibers after the dissolution of POE. The weight ratio of POE/PTT is: (a)95/5; (b)90/10; (c)85/15;

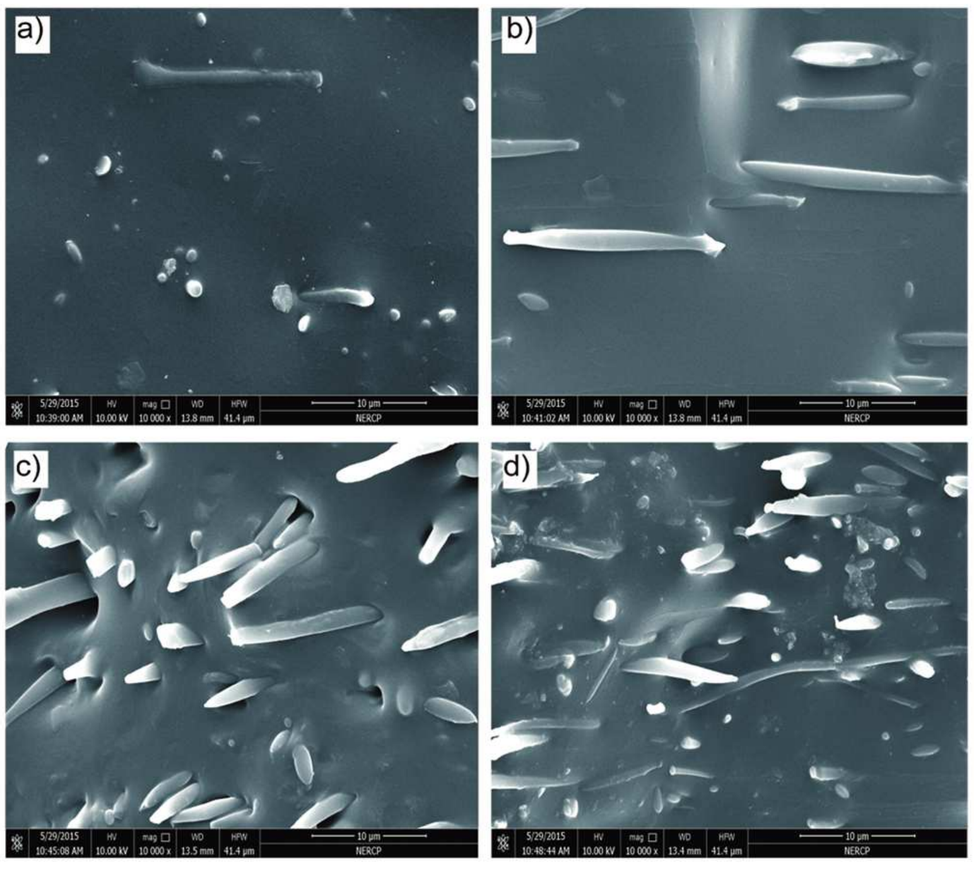

Figure 5 the morphology of the products by compression molding using some sheet of the POE/PTT microfibrillar composites. The weight ratio of POE/PTT is: (a)95/5; (b)90/10; (c)85/15; (d)80/20

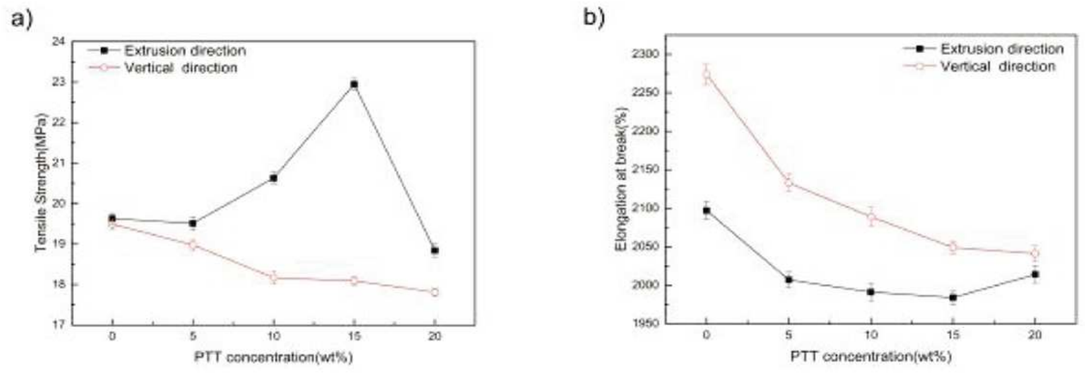

Figure 6 the mechanical property of the POE/PTT sheets along the extrusion direction and the vertical direction: (a)The tensile strength; (b)The elongation at break