２０２１年３月　６日

学 位 論 文 の 内 容 の 要 約

氏　　名	奈良　早織
学位の種類	博士（工学）
学府又は研究科・専攻	大学院工学府　応用化学専攻
指導を受けた大学	東京農工大学
学位論文題目	High Performance Poly(phenylene sulfide) Blend

【論文の内容の要約】

Poly(phenylene sulfide) (PPS) is a high-performance crystalline super-engineering plastic which has high thermal stability, excellent chemical resistance, and good dimensional stability. However, PPS has serious drawbacks of its low toughness. Moreover, injection molding is difficult because there is a small difference between the melting temperature (T_{m}) and melt crystallization temperature (T_{mc}), and PPS solidifies quickly. In this thesis, we investigated improvement of toughness of PPS and control of the crystallization behavior by blending different kind of polymers. It was found that the T_{mc} of PPS was lowered and the tensile elongation was improved by blending poly(phenylsulfone) (PPSU), which is amorphous super-engineering plastic, due to the improvement of the interfacial adhesion owing to the partial miscibility between PPS and PPSU. Small-angle X-ray scattering measurements revealed that the PPSU chains were penetrated the amorphous region between the PPS crystal lamellas due to the partial miscibility between PPS and PPSU. Super-tough PPS-based blends were generated by melt blending PPS with poly(ethylene-*ran*-methacrylate-*ran*-glycidyl methacrylate) (EGMA) and PPSU. The interfacial reaction between PPS and EGMA, and partial miscibility between PPS and PPSU, both demonstrated to play important synergistic roles. It was found for the first time that the crystallization rate of PPS was significantly delayed and the T_{mc} decreased by blending with a very small amount of poly(*N*-vinylpyrrolidone) (PVP), although the blends were phase-separated. The delay in crystallization may be due to the partial miscibility that result in the entanglement of PVP chains at the crystal growth front of PPS.