

GENERATION OF NETWORK STRUCTURE OF PEO-PPO COPOLYMER FOR LITHIUM BATTERY

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PEO-PPO copolymers are the polymers with certainly crystallinity and low tensile strength. According to good mechanical properties and lowly crystallinity as a solid electrolyte polymer used in the lithium battery, the copolymer could be conducted into improvement by the distinctive chemical crosslinkers. In this research, crosslinking degrees, crystallinities and rheological properties of PEO-PPO copolymer after chemical crosslinkings were characterized by measurements of gel content, DSC and dynamic rheometer. The results indicated that the semi-interpenetrating network of PEO-PPO copolymer with PMMA, and the crosslinked PEO-PPO copolymer by silane grafting show an obviously reducing of crystallinities. The crystallinity of PEO-PPO copolymer in the semi-interpenetrating network depended on the mole fraction of MMA monomer and the concentration of initiator. In the case of silane grafting and crosslinking, the content of vinyl-trimethoxysilane (VTMOS) at the constant VTMOS/DCUP ratio were determined for the optimized properties of PPO-PEO copolymer. The degradation of PEO-PPO copolymer in the presence of peroxide was strongly inhibited by VTMOS, and it is found VTMOS shows an effect of nucleation on PEO-PPO copolymer, especially in the high content of VTMOS (>4 phr). The crosslinking mechanism of silane grafting and then crosslinking in PPO-PEO copolymer is discussed.