

에너지 소재용 가지형 공중합체

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Our work has been devoted to the study of polymeric materials, particularly self-organizing and nanostructured graft copolymer systems, for applications including dye-sensitized solar cells (DSSC), polymer electrolyte membranes fuel cells (PEMFC), rechargeable batteries and separation membranes. The "grafting from" technology to prepare the well-defined microphase-separated structure of polymeric materials using atom transfer radical polymerization (ATRP) will be introduced in this presentation. Various amphiphilic graft copolymers were synthesized through this approach. Graft copolymers incorporating ion conducting groups are being explored as polymer electrolytes for fuel cells as well as solar cells. We also show that these materials can serve as a structure-directing agent for organized mesoporous TiO₂ photoelectrodes for solid-state DSSC employing polymer electrolytes. Finally, we demonstrate the applicability of graft copolymer membranes for the separation of CO₂ or olefin.