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Effects of Cationic Pendant Groups on Ionic Conductivity for Anion Exchange Membranes: StructureConductivity Relationships[1] SO-JEONG KIM, School of Chemical and Biological Engineering, Institute of Chemical Processes, Seoul National University, Seoul 08826, Korea, SOO-HYUNG CHOI, Department of Chemical Engineering, Hongik University, Seoul, 121-791, Republic of Korea, WON BO LEE, School of Chemical and Biological Engineering, Institute of Chemical Processes, Seoul National University, Seoul 08826, Korea — Anion exchange membranes(AEMs) have been widely studied due to their various applications, especially for Fuel cells. Previous proton exchange membranes(PEMs), such as Nafions have better conductivity than AEMs so far. However, technical limitations such as slow electrode kinetics, carbon monoxide (CO) poisoning of metal catalysts, high methanol crossover and high cost of Pt-based catalyst detered further usages. AEMs have advantages to supplement its drawbacks. AEMs are environmentally friendly and cost-efficient. Based on the well-defined block copolymer, self-assembled morphology is expected to have some relationship with its ionic conductivity. Recently AEMs based on various cations, including ammonium, phosphonium, guanidinium, imidazolium, metal cation, and benzimidazolium cations have been developed and extensively studied with the aim to prepare high- performance AEMs. But more fundamental approach, such as relationships between nanostructure and conductivity is needed. We use well-defined block copolymer Poly(styrene-block-isoprene) as a backbone which is synthesized by anionic polymerization. Then we graft various cationic functional groups and analysis the relation between morphology and conductivity.

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