MORPHOLOGY AND PROCESSING CONDITIONS OF PERFLUORINATED IONOMERS

Novel perfluorinated ionomers (PFSAs) are utilized as proton exchange membranes in fuel cells. High temperatures are used during the membrane casting process to achieve desired phase separated morphology that allows for improved proton conductivity and mechanical integrity.

3M developed multi-acid sidechain ionomers with high conductivity and crystallinity. SAXS is utilized to determine the effect of sidechain structure on the resulting aggregate morphology.

Dissolution of poly(ether ether ketone) (PEEK), poly(phenylene sulfide) (PPS), and poly(ethylene terephthalate) (PET) creates complex gel and aerogel morphologies. Blocky sulfonation of PEEK in the thermoreversible gel state allows for high crystallizability with profoundly improved transport properties.

High-resolution $^{13}$C NMR can be used to evaluate the comonomer sequence of brominated syndiotactic polystyrene copolymers.

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