

Synthesis of Poly(amide-imide)/Polydimethylsiloxane Graft Copolymer and Its Properties as Separation Membrane

by

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Abstract

The synthesis of siloxane-grafted poly(amide-imide) with an aromatic backbone was carried out by a macromonomer method. 3,5-Bis(4-aminophenoxy)benzyloxypropyl-terminated polydimethylsiloxane (BABP-PDMS) was used as a macromonomer. BABP-PDMSs with different chain lengths were prepared by the hydrosilylation of allyl 3,5-bis(4-nitrophenoxy)benzyl ether with hydrosilyl-terminated polydimethylsiloxanes using Pt catalyst, followed by hydrogenation reduction of the terminal dinitro groups. The polycondensations of BABP-PDMSs with trimellitic dianhydride chloride yielded the desired siloxane-grafted poly(amide-imide) copolymers (PAI-g-PDMS). PAI-g-PDMS membranes were prepared by the solvent casting method from NMP solutions, and the gas permeability and the pervaporation property of these membranes were evaluated. As a result, higher organic-permselectivity was observed in both of the gas and liquid permeations with increasing siloxane content of the graft copolymer membranes.

Key Word: polydimethylsiloxane / poly(amide-imide) / graft copolymer / gas permeability / pervaporation

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