

Microphase-separated lamellar structure formed by surface graft polymerization and its implication for CO₂ separation

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Microphase-separated lamellar structure polymer membranes are prepared by surface graft polymerization of poly(ethylene glycol)behenyl ether methacrylate onto poly(trimethylsilyl) propyne in the presence of allylamine. The contribution of allylamine is to control the crystalline phase, configuration and permeation properties. The high performance (CO₂ permeability of 501 Barrer and CO₂/N₂ ideal selectivity of 77.2) is achieved, which exceed the Robeson upper bound limit. This work exhibits the possibility of surpassing the upper bound limit through a simple surface modification method.