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Permeation and separation characteristics in removal of dilute volatile organic compounds from aqueous solutions through copolymer membranes consisted of poly(styrene) and poly(dimethylsiloxane) containing a hydrophobic ionic liquid by pervaporation

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ABSTRACT

This paper describes the removal of volatile organic compounds (VOCs) such as chloroform, benzene and toluene from aqueous solutions of dilute VOCs using the poly(styrene)-*b*-poly(dimethylsiloxane) (PSt-*b*-PDMS) membranes containing an ionic liquid, 1-allyl-3-butylimidazilium bis (trifluoromethane sulfonyl) imide ([ABIM]TFSI) ([ABIM]TFSI/PSt-*b*-PDMS) by pervaporation. When aqueous solutions of 0.05wt% VOCs were permeated through [ABIM]TFSI/PSt-*b*-PDMS membranes, they showed strong VOC/water selectivity. Both the permeability and the VOC permselectivity of [ABIM]TFSI/PSt-*b*-PDMS membranes were enhanced by