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INFLUENCE OF IONIC LIQUID CONTENT ON TRANSPORT PROPERTIES OF DENSE POLYMERIC MEMBRANES

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Pervaporation was used for the removal of butan-1-ol from its 5 wt. % aqueous solution at which concentration *Clostridium acetobutylicum* fermentation slows down. Two types of membranes were used: a polydimethylsiloxane (PDMS) membrane containing 0, 10, 20 or 30 wt. % of ionic liquid benzyl-3-butylimidazolium tetrafluoroborate ([BBIM][BF₄]) and a polyethylene (PE) membrane in which [BBIM][BF₄] was sandwiched between two PE films. Differential scanning calorimetry measurements showed that PDMS and [BBIM][BF₄] are not compatible and although optically homogeneous, PDMS-[BBIM][BF₄] membranes contained PDMS and [BBIM][BF₄] phases. Pervaporation selectivity increased and the total flux through the membrane moderately raised with the increased content of [BBIM][BF₄] in the PDMS-[BBIM][BF₄] membranes. Hence, the immobilization of a proper ionic liquid in the membrane could be the good method for removal of the alcohol from fermentation broths by pervaporation. On the contrary, [BBIM][BF₄] layer sandwiched between two PE films had no practical effect on the pervaporation properties.

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