



národní
úložiště
šedé
literatury

Mathematical Balance of Ethanol Vapour Permeation Flux in Ionic Liquid Membrane

Sedláková, Zuzana
2015

Dostupný z <http://www.nusl.cz/ntk/nusl-189268>

Dílo je chráněno podle autorského zákona č. 121/2000 Sb.

Tento dokument byl stažen z Národního úložiště šedé literatury (NUŠL).

Datum stažení: 06.05.2024

Další dokumenty můžete najít prostřednictvím vyhledávacího rozhraní [nusl.cz](http://www.nusl.cz) .

MATHEMATICAL BALANCE OF ETHANOL VAPOUR PERMEATION FLUX IN IONIC LIQUID MEMBRANE

Sedláková Z., Morávková L., Vejražka J., Izák P.

*Institute of Chemical Process Fundamentals of the Czech Academy of Sciences, v.v.i.,
Rozvojová 135, 16502 Prague 6, Czech Republic*

The mass balance was used for evaluation of ethanol vapour flux in the ionic liquid polymer gel membrane. The gel membrane was based on poly(vinylidene fluoride-co-hexafluoropropylene) which contained 80 wt. % of the imidazolium-based ionic liquid 1-ethyl-3-methylimidazolium bis(trifluoromethylsulphonyl) imide. The feed stream contained nitrogen saturated with ethanol vapours. The ethanol vapour concentration in feed was changed by increasing the temperature in the saturator (i.e. the pressure of saturated vapour increased). The feed was used either as obtained or mixed with dry nitrogen to cover lower ethanol vapour activity range. The ethanol vapour permeation was studied at three temperatures, namely 25, 35 and 45°C. Interestingly, ethanol permeability was found immeasurably low in neat polymer membrane while ethanol permeability reached approximately 2500 Barrer in the ionic liquid membrane at the highest ethanol vapour activity. Two variants of the mass balance equations were used. The results were compared for both variants. The ethanol vapour permeation flux in ionic liquid membrane was found to be same at lower ethanol vapour for both mathematical procedures. Contrary, the ethanol vapour flux were found to differ at higher ethanol activities.

Acknowledgement

The financial support from the Ministry of Education, Youth and Sports (project LD-14094) is greatly appreciated.