BREATHABLE MEMBRANES BASED ON PEBAX BLENDED WITH IONIC LIQUIDS

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Abstract

As controllable materials, ionic liquids (ILs) can be added into Pebax membrane to systematically adjust its performance of permeating water. Our experiments for Pebax membrane blended with [C_{12}Mim][Cl] IL indicate that the permeability of water molecules increases with both temperature and IL concentration. Correspondingly, our molecular dynamics simulations indicate that most water molecules stay in the vicinity of the polar region of the IL formed by the cationic head groups and anions. Therefore, with increasing temperature or concentration of the IL, the effective affinity area accessible for water molecules increases, leading to the increase of both solubility and diffusivity of water, and thus permeability as their production. New insightful indication about confinement effects on ILs properties is provided.

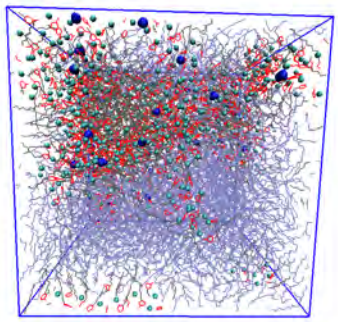

Figure 1. Most water molecules stay in the vicinity of the polar region of the IL.

References

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