Membrane separation has been developed in the field of water purification such as reverse osmosis. The next frontier of the membrane technology is gas and vapor separation. Purification of air is expected to be a new application of membrane separation. In the room or exhaust air, there are many gasses to be separated, such as CO2, humidity (water vapor), VOC (volatile organic compounds). Liquid membrane processes have been proved to be effective for the separation of these gas or vapor in the air by the author. Unlike for polymer membrane, liquid membrane needs special support system under a transmembrane pressure condition. The author has developed an original supported liquid membrane configuration on a hydrophobic microporous membrane. Membrane material could be selected as a suitable liquid for a gas to be separated. Hygroscopic liquid such as glycol can be applied to a dehumidification of air. Amin liquid was applicable to separation of CO2 from air. The separation performances of these membrane processes using a flat membrane module will be shown. “Permeability” is the basic property of a membrane for gas and vapor separation, where the membrane has no pore and uniform material. Usually, this property, permeability, is defined for polymer membranes. In our work, permeability of liquid was evaluated. The permeabilities for ionic liquid and amine liquid were analyzed based on the solution-diffusion mechanism.

About the Speaker

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