Electronic Supplementary Material (ESI) for RSC Advances.

Supporting information

Highly selective thin film composite hollow fiber membranes for mixed vapor/gas separation

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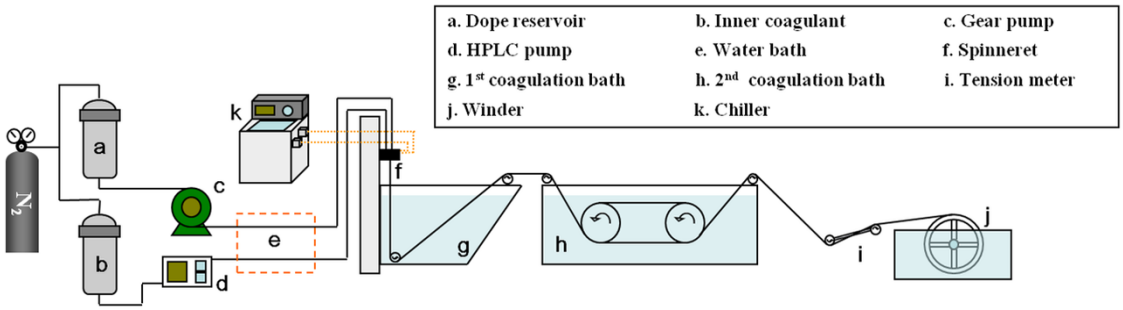

Fig. S1: Schematic diagram of hollow fiber membrane spinning system.

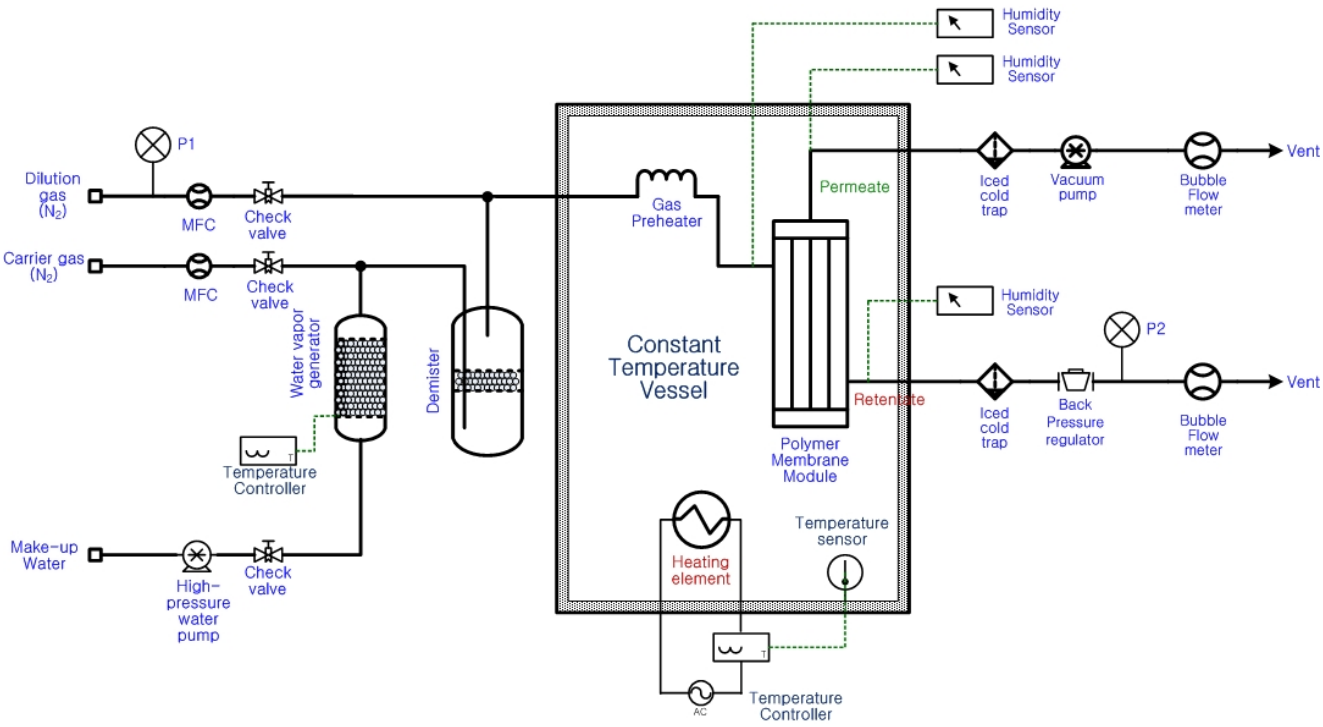

Fig. S2: Schematic diagram of mixed gas vapor permeation set-up for the measurement of gas/ water vapor mixtures.

Figure S2 shows the schematic diagram of mixed gas vapor permeation set-up for the measurement of water vapor/N_2 mixtures. A mixed vapor/gas permeation measurement apparatus was developed and that has been used in our laboratory for last few years, as schematic diagram shown in Figure S2. Over a wide temperature and pressure, with fine vapor activity control in the feed streams this mixed vapor/gas permeation set-up can be used for measuring the permeance of water vapor and gas mixtures simultaneously. The feed as a mixture gas or the single gas were supplied at a fixed temperature and pressure to the membrane module. The permeate side of the hollow fiber membrane consists of a known calibrated volume which was initially evacuated to 0.99 bar vacuum. Before determining the permeability, the known calibrated volume was isolated from the vacuum to evaluate the rate of air leaking from the ambient through fittings

between tubes and valves, by monitoring the rate of pressure increase in the calibrated volume (under zero pressure drop). The feed gas at desired pressure was then preheated by a heating loop before proceeding to the membrane module. The pressure increase in the permeate side due to the permeation of gas across the module was monitored. The membrane module and the heating loop are placed in a fan forced oven. The oven was modified as par experimental requirement and the stainless steel tube fittings through the side wall. The equations for the calculation of permeance, selectivity are revealed in the manuscript.