

Ceramic-Supported Polyhedral Oligomeric Silsesquioxane-Organosilica Nanocomposite Membrane for Efficient Gas Separation

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----- (SI-1) -----

The diffusivity (D) of CO₂ as a function of POSS content is shown in Figure S1. D is calculated based on the equation: $P=D\cdot S$. P is the permeability that can be calculated using the permeance of CO₂ (40 °C) divided by the membrane thickness of 200nm.^{23,25} The solubility of S is obtained from the adsorption amount of CO₂ at 308 K (pure BTESE was tested at 298 K).

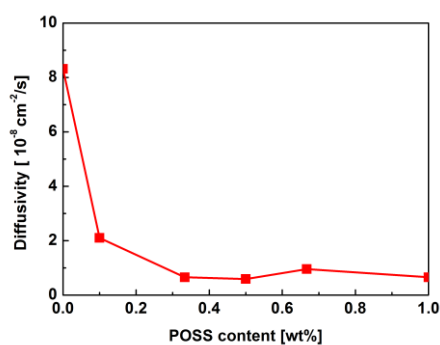


Figure S1. Diffusivity of CO₂ around 40 °C as a function of POSS content.

----- (SI-2) -----

The surface morphology of BTESE-POSS composite film was characterized via a laser microscope (KEYENCE, VK-X200), as shown in Figure S2.

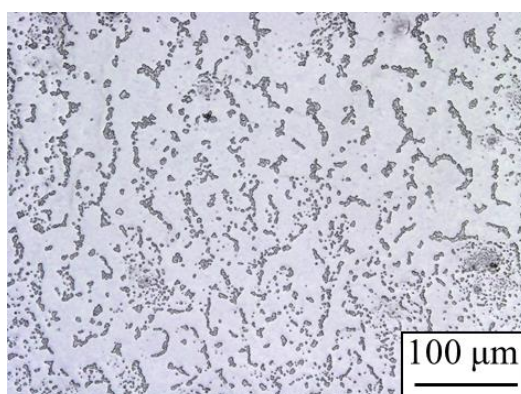


Figure S2. Microscopic surface image of BTESE-POSS (33.3%) film.