

**CO<sub>2</sub> separation performances of carbon molecular sieve membranes derived from polyimide/polyvinylpyrrolidone blend polymer precursors: Effect of molecular weight of polyvinylpyrrolidone**

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Carbon molecular sieve (CMS) membranes were prepared by the pyrolysis of polyimide (PI) / polyvinylpyrrolidone (PVP) blend polymer precursors. We have prepared the blend polymer using thermally stable polymer and thermally labile polymer and investigated the effect of the thermally labile polymer on the morphological characteristics and gas separation properties of the CMS membranes. Thermogravimetric analysis (TGA) showed the two-step degradation of polymer blend precursors. In pure gas permeation experiments using CO<sub>2</sub>, O<sub>2</sub>, N<sub>2</sub> and CH<sub>4</sub> gases, that is, it was revealed that the existence of thermally labile polymer, PVP, affected significantly the gas permeation characteristics of final CMS membranes. The gas permeabilities through the CMS membranes increased with the molecular weight of PVP in PI matrix and decreased with pyrolysis temperature.