CO₂ Absorption from Its Mixture with CH₄ or N₂ through Hollow Fiber Membrane Contactor using Water as Solvent. Hollow fiber membrane contactors have been widely used as gas-liquid contactors recently such as in the CO₂ absorption process from gas stream. This research aims to evaluate the effectiveness of hollow fiber membrane contactor to absorb CO₂ from its mixture with CH₄ or N₂ using water through mass transfer and hydrodynamic tests. There are 3 membrane modules used in this research with shell diameter of 1.9 cm, length of 40 cm, outer fiber diameter of 2.7 mm and fiber number in the contactors of 10, 15 and 20. Liquid flow rates in the hollow fiber membrane contactors are varied in this research. Research results show that mass transfer coefficients in the membrane contactor increase with increasing liquid flow rate and decrease with increasing fiber number in the contactor. Flux of CO₂ into water can achieve 1.4×10⁻⁹ mol CO₂/m².s and mass transfer coefficients can achieve 1.23 x 10⁻⁷ m/s. Meanwhile, hydrodynamic test results show that water pressure drop in the membrane contactors increase with increasing fiber number in the contactors.

Keywords: hollow fiber, contactor, mass transfer