

Preliminary studies on the selective absorption of CO₂ from CH₄ through hollow fiber membrane contactor using aqueous extract of noni fruit (*Morinda citrifolia*)

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Abstrak

The study has been conducted to evaluate the effectiveness of the natural solvent from noni fruit for CO₂ gas absorption from CH₄ through hollow fiber membrane gas-liquid contactors. The solvent was made of 100 grams noni fruit per liter of water. In experiments, the solvent flowed to the shell side of the contactor, while the gas mixture flowed to the lumen fiber. The experimental results showed that mass transfer coefficients in the contactors increased with increasing liquid flow rate and decreasing number of fibers in the contactors. Mass transfer correlation indicated that the mass transfer in the contactor was dominated by turbulent flow. Hydrodynamics analysis of the contactors showed that at the same Reynolds number pressure drops increased with increasing packing density due to an increase in friction between fibers and water. The friction factor ratio data revealed that the fiber surface did not behave like a smooth pipe within the range of velocities in the experiments. Based on QI and Cussler coefficients, chemical absorption occurred during experiments, which might be indicated by the appearance of new compounds in the chemical analysis of the aqueous extract from noni fruit after absorption.