Pengaruh laju alir gas CO2 dalam proses penyerapannya dengan air menggunakan membran superhidrofobik sebagai kontaktor = The effect of gas flow variaton in the utilization of superhydrophobic membrane for carbon dioxide absorption using water as absorbent

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Abstrak

[ABSTRAK
Tujuan dari pelaksanaan penelitian ini adalah untuk menguji performa penyerapan gas CO2 dengan menggunakan kontaktor membran superhidrofobik. Adapun variasi yang diuji pada penelitian ini adalah pengaruh laju alir gas CO2 (160, 240, dan 320 mL/menit) dan jumlah serat membran kontaktor (2000, 4000, dan 6000). Pada penelitian ini, didapatkan hasil yaitu peningkatan dari laju alir gas umpan menurunkan efisiensi dari proses, namun meningkatkan kapasitas penyerapan dan koefisien perpindahan massa secara menyeluruh. Pada peningkatan jumlah membran, terjadi peningkatan untuk nilai efisiensi, kapasitas penyerapan, dan koefisien perpindahan massa secara menyeluruh. Nilai efisiensi penyerapan tertinggi tercapai sebesar 29% pada laju alir gas umpan sebesar 160 mL/menit dan jumlah serat membran sebesar 6000. Nilai koefisien perpindahan massa dan kapasitas penyerapan tertinggi adalah 1,14x10-4 cm/s dan 0.045 mmol pada laju alir gas 320mL/menit dan jumlah serat membran sebesar 6000.
ABStRACT
The purpose of this experiment is to examine the performance of superhydrophobic contactor in the absorption of CO2 using water. The variation tested in this experiment is the CO2 gas flow rate (160, 240, 320 mL/min) and the number of fiber modules (2000, 4000, and 6000). The results obtained from this experiment is, the increasement of gas flow rate reduces the absorption efficiency, and increases the absorption capacity and the overall mass transfer coefficient. As the number of fibers increases, the efficiency, overall mass transfer coefficient, and absorption capacity also increases. The maximum value for efficiency is 29% and obtained for 160 mL/min gas flow rate and 6000 module fibers. The maximum value for overall mass transfer coefficient and absorption capacity are 1.14x10-4 cm/s and 0.045 mmol respectively for 320 mL/min gas flow rate and 6000 number module.;The purpose of this experiment is to examine the performance of superhydrophobic contactor in the absorption of CO2 using water. The variation tested in this experiment is the CO2 gas flow rate (160, 240, 320 mL/min) and the number of fiber modules (2000, 4000, and 6000). The results obtained from this experiment is, the increasement of gas flow rate reduces the absorption efficiency, and increases the absorption capacity and the overall mass transfer coefficient. As the number of fibers increases, the efficiency, overall mass transfer coefficient, and absorption capacity also increases. The maximum value for efficiency is 29% and obtained for 160 mL/min gas flow rate and 6000 module fibers. The maximum value for overall mass transfer coefficient and absorption capacity are 1.14x10-4 cm/s and 0.045 mmol respectively for 320 mL/min gas flow rate and 6000 number module., The purpose of this experiment is to examine the performance of superhydrophobic contactor in the absorption of CO2 using water. The variation tested in this experiment is the CO2 gas flow rate (160, 240, 320 mL/min) and the number of fiber modules (2000, 4000, and 6000). The results obtained from this experiment is, the increasement of gas flow rate reduces the absorption efficiency, and increases

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