

ABSORPSI CO₂ DALAM GAS ALAM MENGGUNAKAN LARUTAN KALIUM KARBONAT (K₂CO₃) DENGAN PROMOTOR METIL DIETANOL AMIN (MDEA)

Muhrinsyah Fatimura
Email : muhrinsyah.f@gmail.com

ABSTRACT

Chemical absorption is the process that is commonly used in industries to reduce CO₂ levels. One of the chemical absorption processes are widely used in industry is the process by using a solution of K₂CO₃. The addition of MDEA is generally used to increase the amount of CO₂ loading in absorbent solution. This study aims to know how much CO₂ absorption in a solution of potassium carbonate (K₂CO₃) with the addition of promotor methyl diethanol amine (MDEA) in Packed Column Absorber. Research using Compressed Natural Gas natural gas (CNG) containing CO₂ a solution of potassium carbonate + MDEA. Absorbent solution flowed into the packed column from above and is contacted in the opposite direction (counter current) with a flow of natural gas. CO₂ gas and CO₂ initially remaining analyzed by gravimetric methods by contacting the solution into Ca(OH)₂. From the research results can be concluded that the addition of MDEA in the range 1-3 wt% concentration in a solution of K₂CO₃ 30% wt to 313 K and the temperature variation of the absorbent flow rate 4.95 ml / s, 7.26 ml / s, 10.75 ml / s natural gas with a flow rate 6 liters / min at a pressure of 2.7 bar will increase the amount of CO₂ absorbed where the added MDEA 3% and absorbent flow rate 10.75 ml / s obtained most of the CO₂ absorbed 69.45%. While the length of contact time 2,4,6,8, minutes did not affect the% of CO₂ is absorbed.

Key words: Natural gas, Promotor, MDEA, Absorption, CO₂, Absorbent, Packed Column Absorber.

ABSTRAK

Absorpsi kimia adalah proses yang sudah umum digunakan dalam industri-industri untuk mereduksi kadar CO₂. Salah satu proses absorpsi kimia yang luas digunakan di industri adalah proses dengan menggunakan larutan K₂CO₃. Penambahan MDEA umumnya digunakan untuk meningkatkan jumlah CO₂ loading dalam larutan penyerap. Penelitian ini bertujuan untuk Mengetahui seberapa besar absorpsi CO₂ dalam larutan kalium karbonat (K₂CO₃) dengan penambahan *promotor* metil dietanol amin (MDEA) pada *Packed Column Absorber*. Penelitian menggunakan Gas alam *Compressed natural gas* (CNG) yang mengandung CO₂ serta larutan potasium karbonat + MDEA. Larutan Absorben dialirkan kedalam *packed column Absorber* dari bagian atas kolom dan dikontakkan secara berlawanan arah (*counter current*) dengan aliran gas alam. gas CO₂ mula-mula dan CO₂ sisa dianalisa dengan metode gravimetri dengan mengontakkan kedalam larutan Ca(OH)₂. Dari hasil penelitian dapat disimpulkan bahwa penambahan MDEA pada range konsentrasi 1-3 %wt dalam larutan K₂CO₃ 30%wt untuk suhu 313 K serta variasi laju alir absorben 4,95 ml/s, 7,26 ml/s, 10,75 ml/s dengan laju alir gas alam 6 liter/min pada tekanan 2,7 bar akan menaikkan jumlah CO₂ terserap dimana pada penambahan MDEA 3 % dan laju alir absorben 10,75 ml/s didapat CO₂ terserap paling besar yaitu 69,45 %. Sedangkan lamanya waktu kontak 2,4,6,8, menit tidak mempengaruhi % CO₂ yang terserap.

Kata kunci : Gas alam, Promotor, MDEA, Absorpsi, CO₂, Absorben, *Packed Column Absorber*.

