

Accepted Manuscript

Phase change behavior and kinetics of CO₂ absorption into DMBA/DEEA solution in a wetted-wall column

Lidong Wang, Shanlong An, Qiangwei Li, Songhua Yu, Siyu Wu

PII: S1385-8947(16)31785-5
DOI: <http://dx.doi.org/10.1016/j.cej.2016.12.033>
Reference: CEJ 16198

To appear in: *Chemical Engineering Journal*

Received Date: 17 October 2016
Revised Date: 5 December 2016
Accepted Date: 8 December 2016



Please cite this article as: L. Wang, S. An, Q. Li, S. Yu, S. Wu, Phase change behavior and kinetics of CO₂ absorption into DMBA/DEEA solution in a wetted-wall column, *Chemical Engineering Journal* (2016), doi: <http://dx.doi.org/10.1016/j.cej.2016.12.033>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**Phase change behavior and kinetics of CO₂ absorption into
DMBA/DEEA solution in a wetted-wall column**

Lidong Wang^{*}, Shanlong An, Qiangwei Li, Songhua Yu, Siyu Wu

School of Environmental Science and Engineering, North China Electric Power

University, Baoding 071003, China

Abstract

Coal-fired flue gas is a major source of greenhouse gas CO₂. Phase-change absorbents can be used to reduce energy consumption associated with regeneration during CO₂ capture. In this study, N,N-dimethylbutylamine (DMBA) and N,N-dimethylbutylamine (DEEA) were mixed to develop phase-change absorbents, and the reaction kinetics of CO₂ absorption in the absorbents were examined. A bubbling device was used to prepare phase-change absorbents with different CO₂ loading levels. The physico-chemical parameters of the absorbents under different conditions were specified, and the changes in the CO₂ loading of the upper and lower layers of the absorption solutions after a liquid–liquid separation were analyzed. A wetted-wall column was subsequently used to investigate the effects of temperature, CO₂ loading, gas flow rate, and DMBA/DEEA composition ratio on CO₂ absorption rate. This study determined that the flow velocity, reaction temperature, and CO₂ loading affected the CO₂ absorption rates to a certain extent. In addition, comparing

^{*}Corresponding author. Tel.: +86 312 7525511.

E-mail address: halburtwang@163.com

Download English Version:

<https://daneshyari.com/en/article/4763168>

Download Persian Version:

<https://daneshyari.com/article/4763168>

[Daneshyari.com](https://daneshyari.com)