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A numerical analysis for CO_2 recovery from aqueous absorbent solution by hollow fiber membrane contactor

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ABSTRACT

A novel theoretical analysis was performed to strip CO_2 from an aqueous diethanolamine (DEA) solution using a membrane contactor, which is composed of porous hollow fibers. Governing equations of the system were derived for a cocurrent flow scheme of the feed absorbent steam and the permeate stream in a membrane contactor. Those were successfully solved with the proper initial conditions using a personal computer. The computer program was coded with a Compaq Visual Fortran 6.6. The concentration of free DEA and the flow rate of the recovered CO_2 in the permeate could be obtained in terms of the fiber length with changing several operating parameters: temperature in a feed, fractional reaction yield of DEA, feed flow rate and pressure in a permeate.

Keywords: Separation; Carbon dioxide; Hollow fiber contactor; Numerical analysis

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