

## Modeling and Simulation of Intensified Absorber and Desorber for Carbon Capture

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One of the problems of post-combustion carbon capture is that the size of the packed bed is too large to apply to the power plants. The rotating packed bed is proposed as a process intensification unit for carbon capture. Rotating packed bed increases the interfacial area between liquid and vapor by centrifugal force; therefore, the smaller volume of rotating packed bed compared to the conventional packed bed could capture the same amount of CO<sub>2</sub>. Another advantage of RPB is that the high concentration of the MEA solvent could be used. This also helps to reduce the size of the bed. In this study, the rotating packed bed for absorber using monoethanolamine is simulated based on the rate-based model. Enhancement factor model that is based on the film theory is used for modeling of mass transfer. Mass transfer coefficient, interfacial area, and hydraulics models that account the rotational effect are employing in the simulator. The both of rotating packed bed for absorber and stripper are simulated. The developed model is validated with experimental data. Depending on the rotational speed and the concentration of the solvent, the capture rate and the energy use are examined.