

Hydrodynamic of amine absorber under off-shore operation

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The effect of angular motions on the CO₂ removal from natural gas was investigated for an amine absorber with Mellapak 500.X (M500X) structured packing subject to three angular motions (roll, pitch and yaw). A porous medium Eulerian computational fluid dynamics (CFD) model with porous resistance, drag force between gas and liquid, and dispersion force was used to represent hydrodynamic properties of the amine absorber packed-column. Five cases of the angular motions, namely, no motion (Case 1), rolling (Case 2), pitching (Case 3), yawing (Case 4) and three simultaneous angular motions (Case 5) were considered for CFD simulation. An amplitude of 2° and a period of 8 s were applied to all the angular motions. The effectiveness interfacial area of Case 3 was the high and the volume fraction increased by 15% . However, the difference between the interfacial areas of all the cases was not substantial.