

Deterioration of CO₂ removal efficiency by ship motion in amine absorber with structured-packing

Pham Anh Dung, 김정은, 임영일[†]

환경대학교

(limyi@hknu.ac.kr[†])

Acid gases (H₂S and CO₂) must be removed from the crude natural gas. The process performance may be deteriorated due to ship motion on FPSO (Floating production, storage and off-loading). This research aims to investigate the effects of ship motion on acid gas removal performance in the amine absorber with Mellapak 500.X structured packing.

A simple cylindrical column (packed zone: 0.1m diameter × 2.205m high) was used as the domain for the calculations. A porous media CFD (computational fluid dynamics) model was developed in the framework of Eulerian two-fluid flows with user-defined functions (UDF) taking into account liquid dispersion, mass transfer and chemical reactions in the packed zone, the effective interfacial area, mal-distribution factor and the ship motion. CFD simulation results were validated with experimental data measured at the vertical standing column. The process performance was compared for the simulation results for two cases of vertical standing and ship motion.