

Validation of porous media CFD model for structured-packing amine absorber under ocean wave impact

임영일[†], Pham Anh Dung

환경대학교

(limyi@hknu.ac.kr[†])

Acid gases (H₂S and CO₂) absorption efficiency of the packed column on a floating unit may be deteriorated due to the impact of ocean waves. A pilot-scale amine absorber (diameter of 0.4 meters and a height of 4 meters) with structured packing Mellapak 250.X subject to a tilting condition was considered in this study. An Eulerian CFD (computational fluid dynamics) porous media model was used to investigate hydrodynamics of gas-liquid multiphase flow in this absorber. The homogeneous porous media model included appropriate closure laws of porous resistance forces and dispersion forces to mimic the property of the real structured packing. Based on pilot-scale experiments, the appropriate parameters of the models were found to fit experimentally measured data of liquid distribution of the column in cases of static tilting (0, 2, 4 and 6 degree). The CFD results showed a good agreement on acid gas removal efficiency, compared to the experimental data.