Modelling and Simulation of Diffusion Effect on the Glycol Dehydration Unit of a Natural Gas Plant

Authors : M. Wigwe, J. G Akpa, E. N Wami

Abstract : Mathematical models of the absorber of a glycol dehydration facility was developed using the principles of conservation of mass and energy. Models which predict variation of the water content of gas in mole fraction, variation of gas and liquid temperatures across the parking height were developed. These models contain contributions from bulk and diffusion flows. The effect of diffusion on the process occurring in the absorber was studied in this work. The models were validated using the initial conditions in the plant data from Company W TEG unit in Nigeria. The results obtained showed that the effect of diffusion was noticed between z=0 and z=0.004 m. A deviation from plant data of 0% was observed for the gas water content at a residence time of 20 seconds, at z=0.004 m. Similarly, deviations of 1.584% and 2.844% were observed for the gas and TEG temperatures.