

A study of computational fluid dynamics on membrane module in membrane distillation

Abstract

Membrane distillation is one of the recently interest rising membrane separation processes used for the separation of seawater and saline wastewater, and etc. Membrane distillation has the advantage of adopting the low grade waste energy and/or renewable energy such as solar and geothermal energy due to the nature of thermal driven process and low temperature range. Computational Fluid Dynamics (CFD) is a numerical simulation tool that is able to perform the calculation in order to investigate and simulate the performance of the processes that involve fluid, heat and mass transfer. In this study, a direct contact membrane distillation (DCMD) experiment will be studied using hollow fiber membrane module. A three dimensional (3D) CFD simulation will be examined for its viability in the investigation of the DCMD. Furthermore, various CFD multiphase models will be studied for its suitability in predicting heat and mass behavior within the membrane.