

Modelling of heat and mass transfer in the evaporation of a binary mixture in a falling film apparatus

ABSTRACT

A research on a mathematical modeling of simultaneous heat and mass transfer during the process of the evaporation of a saturated binary mixture of n Hexane-Toluene flowing down a tube has been carried out. The flow is characterized by a falling liquid film and the film theory model is used. The geometry retained is a cylindrical column with a smooth uniform heat flux. The objective of the study is to investigate the sensitivity of flow, heat and mass transfer parameters. Functioning and designing of this process on constant transfer parameters will be discussed. The findings show that a higher dependency on the liquid phase parameters along the column height, phase compositions and flux density are found. A further study of the variation of the transfer parameters as a function of the internal flow, composition and chemical properties could be introduced to the given model to establish a model behavior.

Keyword: Falling vertical liquid film; Evaporation; Heat and mass transfer; Binary mixture