

Tutorial-3

Use Aspen Plus V8.8 to solve all the problems.

Problem-1: Shortcut Distillation Calculations: DSTWU

An equimolar mixture of benzene and toluene is to be separated by distillation to produce a distillate containing 90 mol% benzene and a bottom product that contains 98% toluene. The distillation column is to operate at 1 atm pressure and the feed to the column is a saturated liquid. Use the DSTWU programme and the NRTL model to estimate

- a. the minimum reflux ratio and the minimum number of stages to accomplish the separation;
- b. the actual number of stages and the location of the feed stage if the column is operated at 1.2 times the minimum reflux ratio.

Problem-2: Rigorous Distillation Calculations: RadFrac

An equimolar mixture of benzene and toluene is to be separated by distillation to produce a distillate containing 90 mol% benzene and a bottom product that contains 98% toluene. The distillation column is to operate at 1 atm pressure and the feed to the column is a saturated liquid. Use the RADFRAC programme and the NRTL model to estimate

- a. the minimum reflux ratio and the minimum number of stages to accomplish the separation;
- b. the actual number of stages and the location of the feed stage if the column is operated at 1.2 times the minimum reflux ratio.