BTX Columns

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1 About

The petrochemical complex BTX is designed to separate benzene, toluene and light xylenes at the highest purity, to be subsequent use as feedstock for the petrochemical synthesis industry.

Here we try to Simulate BTX column which was successfully simulated in Open source Simulator DWSIM[2] and COCO[3] with the help of ChemSep column, in the OpenModelica with the help of Simulator library which is developed by the FOSSEE group.[1]

2 Overview of Simulation

In this simulation we use NRTL thermodynamics packages and column to separate the equimolar mixture of benzene xylene and toluene.

Feed enter to the first column; from here, lightest compound benzene are separated from the mixture via distillate from the top, this column is controlled by the Refulx ration and bottom molar flowrate for desire purity of the benzene; Bottom product enter into the second column from where heavy compound xylene are separated and from top, we get toluene; this column are controlled in same manner as first column.

3 Result

Desired purity of the all compound from their respective stream is more then 99% and near about 99.5+% mole are recovered.

For the detail analysis of the column, Please run the simulation in OpenModelica.

4 Recommendation

Since, there is no any start value(for this simulation) given in simulation

so it take nearly 1400-1500 second to give result(nearly 20-50 second for simulation time) which can be decreased by providing suitable start value to the output material stream.

References

[1] https://github.com/FOSSEE/OMChemSim

[2] BTX Separation Chain and Energy Optimization proposed by Mr.Koona Prabhu Teja

[3] Simulation in COCO simulator