

Ethylene Glycol Production

The second flow sheet demonstrates the production of ethylene glycol from ethylene oxide and water. Two pure streams of ethylene oxide and water with each flowrates of 180 kmol/h at 1 bar pressure and 110C enters a stream mixer to give a mixed output stream to be used as feed to the plug flow reactor.

The reaction is of first order with respect to ethylene oxide. 42% conversion of ethylene oxide takes place in the reactor. Ethylene glycol is formed as product. Ethylene glycol along with unreacted reactants are cooled and sent to a distillation column with 8 stages for further purification. The feed is sent to 5th stage of the distillation column. The condenser and reboiler pressure are maintained at 1 atm. Reflux ratio of 2 is defined as top specification and product molar flowrate of 10 mol/s is defined as bottom specification. 84% ethylene glycol is obtained as the bottom product. Streamwise results obtained from the simulated flowsheet and are compared with DWSIM and Aspen Plus results.