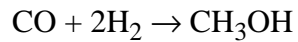


10.213 Homework
9/29/99

Problem 10 Due 10/6

The consider the combination of a continuous steady state catalytic reactor followed by distillation with recycle of the unreacted products at steady state in which the following reaction takes place



Assume that half the reactants are consumed in each pass through the reactor. The distillation produces a stream of methanol with 1% CO. The recycle stream contains 5% methanol. The flow rate of CO is maintained at 1 mole/min.

- What is the flow rate of hydrogen that must be added to the feed stream?
- What is the molar flow rate of the total feed stream to the reactor at steady state?
- What is the molar flow rate from the reactor at steady state?
- What is the composition of the recycle stream coming from the distillation column?