Chemical Reaction Engineering-Beyond the Fundamentals
L.K. Doraiswamy and D. Uner
MODULE 1.2
IDEAL FLOW REACTORS

OBJECTIVE
After the completion of this module, you will be able to set up and solve mole balance and energy balance equations for the ideal flow reactors at steady state

READING ASSIGNMENT
Read pp19-26 from CREBTF.

DERIVE
All of the equations in the assigned section.

COMPUTE

SELF TEST QUESTIONS
Check your conceptual understanding by answering the following questions:

1. A bimolecular gas phase elementary reaction with the stoichiometry A+B→R+S is taking place in a plug flow reactor operating at steady state. Derive the expressions to determine the *space time* progress of concentration for each of the following cases:

    a. $[A]_0=[B]_0$

    b. $[A]_0=2[B]_0$

    c. $[A]_0=[B]_0=1/2 \ [R]_0$

    d. If the concentration versus time data were available, how would you determine the rate constant k? Explain.

2. Rework problem 1 for an MFR operating at steady state.

List at least 5 examples of industrial plug flow reactors	List at least 5 examples of industrial mixed flow reactors
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____