# Home Assignment

<u>Problem 1</u>: Assume that two chemical species A and B, are in a solvent feedstream entering a liquid-phase continuous stirred tank reactor maintained at constant temperature. The two species react irreversibly to form a third species, P. Develop a mathematical model that describes how the concentration of each species changes with time. Assume that the stoichiometry of the reaction is as follows:

$$A + 2B \rightarrow P$$
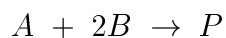
<u>Problem 2</u>: Consider a batch reactor in which the following liquid phase reaction is occurring:

$$A \rightarrow B$$
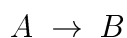
The reaction is first order with rate constant k and is exothermic. The batch reactor is a jacketed vessel and the jacket is maintained at a temperature T_j by an electrical heater. Develop a mathematical model that describes the dynamics of the concentrations of species A and B and the reactor temperature T.