

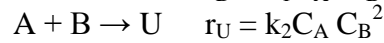
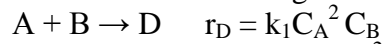
**KSU – Chemical Engineering Department**  
**ChE 320 (Chemical Reactor Engineering) – TUT #8**

Name: \_\_\_\_\_

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1. Consider the following simultaneous reactions:

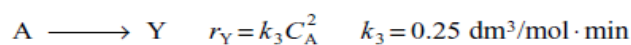
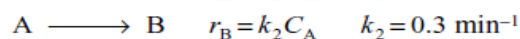
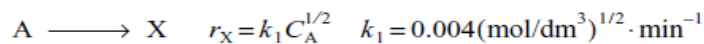


a. What is the instantaneous selectivity  $S_{D/U}$ ?

b. Use three schematic drawings showing how you would run this system so that side reaction is minimum.

2.

Consider the following system of gas-phase reactions:



B is the desired product, and X and Y are foul pollutants that are expensive to get rid of. The specific reaction rates are at 27°C. The reaction system is to be operated at 27°C and 4 atm. Pure A enters the system at a volumetric flow rate of 10 dm<sup>3</sup>/min.

(a) Sketch the instantaneous selectivities ( $S_{B/X}$ ,  $S_{B/Y}$ , and  $S_{B/XY} = r_B/(r_X + r_Y)$ ) as a function of the concentration of  $C_A$ .

(b) Consider a series of reactors. What should be the volume of the first reactor?