A First Course on Kinetics and Reaction Engineering
Unit 18. Reaction Engineering of Batch Reactors

Definitions

batch reactor productivity - amount of product produced in a batch reaction process per unit time taking both the reaction time and the turnaround time into account

turnaround time - time required for the draining of a previous batch from a reactor, cleaning and otherwise preparing the reactor for the next batch and charging the reactor with reactants for the next batch

temporal variations - changes in quantities over time at a fixed position

spatial variations - changes in quantities as a function of spatial position at fixed time

Nomenclature

$S_{D/U}$ instantaneous selectivity parameter for parallel reactions

k_i rate coefficient for the reaction that forms species i

r_i rate of the reaction that forms species i

Equations

$$S \rightarrow D \tag{18.1}$$

$$D \rightarrow U \tag{18.2}$$

$$S \rightarrow D \tag{18.3}$$

$$S \rightarrow U \tag{18.4}$$

$$S_{D/U} = \frac{r_D}{r_U} \tag{18.5}$$

$$S_{D/U} = \frac{k_D}{k_U} \qquad \text{(equal reaction orders)} \tag{18.6}$$