

# A First Course on Kinetics and Reaction Engineering

## Unit 6 Pre-Class Quiz

- Which of the following is NOT a rule that a reaction mechanism must obey?
  - Each step in the mechanism must be an exact description of a reaction event that occurs at the molecular level.
  - Each step in a reaction mechanism must be reversible.
  - The mechanistic steps must be consistent with all available experimental data including kinetics of reaction, isotopic effects upon kinetics, isotope distributions in products, spectroscopic measurements, etc.
  - The only species that are allowed to appear in a reaction mechanism are the apparent, macroscopically observed reactants and products.
  - There must be some linear combination of the mechanistic steps that exactly equals the apparent (non-elementary, macroscopically observed) overall reaction.
- True or False? The rate expression for a macroscopically observed, non-elementary reaction is equal to the sum of the rate expressions for the mechanistic steps.
- True or False? Reactive intermediates are always free radicals.
- Match the step type to its definition
  - Initiation step
  - Propagation step
  - Termination step
  - Chain Transfer step
  - Chain Branching step
  - consumes one or more reactive intermediates without generating any
  - consumes one reactive intermediate and generates two more
  - consumes one reactive intermediate and generates another
  - generates one or more reactive intermediates without consuming any
  - stops one growing chain and starts another
- True or False? Chain transfer steps can lead to explosions if they are not properly controlled.