Key points

1. The Arrhenius expression for the rate constant $k = Ae^{-Ea/RT}$

2. The assumption of transition state theory TST
(transition state is in equilibrium with reactants and products)

3. Relationship of TST rate constant and Arrhenius rate const
   $A = e^{\Delta S^*/R}$ $E_a = \Delta H^*$

4. A catalyst lowers the barrier for a reaction. It provides an alternative reaction pathway, but does not alter the products.

5. Homogeneous vs. Heterogeneous catalysis
   a. Zeolites: shape selective catalysis
   b. Ziegler-Natta: polymerization catalyst
   c. Serine protease