

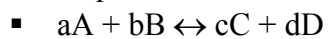
Exam 1 Topics (Chem 1B)

• Chapter 12 - Kinetics

1. Definition of a Rate
2. Rate Law
3. $\text{Rate} = -\frac{\Delta[\text{A}]}{\Delta t} = k[\text{A}]^n$
 - for the reaction: $a\text{A} \rightarrow \text{products}$
4. Differential Rate Law (aka: Rate Law)
 - Use of method of initial rates
 - Two ways of solving...
 - Dr. Kim's Trick
 - Books Mathematical method
 - Determines the powers of the each component
 - Can also solve for k
5. Integrated Rate Law
 - Some concentration vs. **time**
 - Zero order
 - $[\text{A}] = -kt + [\text{A}]_0$
 - $T_{1/2} = \frac{[\text{A}]_0}{2k}$
 - Plot $[\text{A}]$ vs. t to determine if zero order
 - First order
 - $\ln [\text{A}] = -kt + \ln [\text{A}]_0$
 - $T_{1/2} = \frac{0.693}{k}$
 - Plot $\ln [\text{A}]$ vs. t to determine if first order
 - Second order
 - $\frac{1}{[\text{A}]} = kt + \frac{1}{[\text{A}]_0}$
 - $T_{1/2} = \frac{1}{k[\text{A}]_0}$
 - Plot $1/[\text{A}]$ vs. t to determine if second order
 - BE ABLE TO READ A GRAPH
 - Understand the equation of a line.
 - What is the r^2 value mean?
6. When to use Integrated vs. Differential?
 - If you know one you know the other.
7. Arrhenius equation
 - $k = Ae^{-E_a/RT}$
 - plot $\ln k$ vs. $1/T$ to determine the activation energy = slope and frequency factor = y-intercept.
8. Reaction mechanism
9. Catalyst
10. I am probably forgetting something...

- Chapter 13 - Equilibrium

1. What is Equilibrium?



2. $K_{eq} = \frac{[C]^c [D]^d}{[A]^a [B]^b}$

3. $K_{P_{eq}} = \frac{(P_C)^c (P_D)^d}{(P_A)^a (P_B)^b}$

4. Remember why we can do that trick with pressure.

5. $K_{P_{eq}} = K_{eq} (RT)^{\Delta n}$

6. $Q = \frac{[C]^c [D]^d}{[A]^a [B]^b}$

7. Relationship between Q and K

8. ICE Tables

9. Le Châtelier's Principle

10. I am probably forgetting something...