Name: _____ Period: _____

Guided Notes: Rate Laws

Review: Molarity

- measures the _____
- solute is measured in _____
- solution is measured in _____
- abbreviated with a capital _____

Practice:

1. What is the molarity of a solution that has 10 grams of sodium sulfate in 100 mL of solution?

Rate Laws:

- increased concentration of a _____ usually _____ the rate of a reaction
- however, _____ concentration might actually have little effect on the rate of _____

Rate Order and Rate Laws:

- For the reaction A + B → C + D
- General form of Rate Law:

$$\text{rate} = k[A]^x[B]^y$$

- rate laws are found _____
  - change the concentration of _____ at a time to see how the rates are affected
- Rate units: M/s (change in molarity per second)

Rate Law Example #1:

Reaction: A + B → C

Trial	[A]	[B]	Rate (M/sec)
1	1.0	2.0	0.50
2	2.0	2.0	1.00
3	2.0	6.0	3.00

1. What happens to the rate when [A] doubles?
2. What is the rate order of reactant A?
3. What happens to the rate when B triples?
4. What is the rate order of reactant B?
5. What is the rate law for this reaction?

Rate Law Example #2:

Reaction: A → B + C

Trial	[A]	Rate (M/sec)
1	2.5	1.00
2	5.0	4.00
3	7.5	16.00

1. What happens to the rate when [A] doubles?
2. What is the rate order of reactant A?
3. What is the rate law for this reaction?

Rate Law Example #3:

Reaction: A + B → C

Trial	[A]	[B]	Rate (M/sec)
1	2.0	4.0	3.0
2	6.0	2.0	1.5
3	6.0	4.0	3.0

1. What happens to the rate when [A] triples?
2. What is the rate order of reactant A?
3. What happens to the rate when [B] doubles?
4. What is the rate order of reactant B?
5. What is the rate law for this reaction?