

CST Worksheet #5: Acids/Bases, Kinetics, Equilibrium Study Guide (Standards 5, 8 & 9)

- What is an electrolyte?
- What three types of solutions are electrolytes?
- Which of the following are electrolytes (circle your responses)?

a. Acetic acid	b. Sucrose	c. Ethyl alcohol
d. NaOH	e. NaF	f. NH_4NO_3
		g. H_2SO_4
- What do acids do with protons (H^+)? What do bases do with protons (H^+)?
- List the properties of acids:
- List the properties of bases:
- What is the difference between strong and weak acids?
- A solution with a pH of 4 is (acidic/basic) and has an H^+ concentration that is _____ times (greater/less) than a solution with a pH of 7.
- What two things need to happen for a collision to be EFFECTIVE?
- What is activation energy and what does it have to do with reactions?
- As a reaction happens, the amount of _____ decrease and the amount of _____ increase.
- Reaction rates depend on the amount of _____ happening at a certain time.
- Fill in the following chart:

If...	the concentration of reactants increases	the concentration of reactants decreases	the pressure of gases increases	the pressure of gases decreases	the temperature increases	the temperature decreases
Then...						
the reaction rate...						

- Explain how a catalyst works (explain using activation energy and reaction rate).
- When a reaction is at equilibrium, the forward and reverse reaction rates are _____ and the product and reactant concentrations are _____.
- For the following reaction, when the:

$$\text{N}_2 (\text{g}) + 3\text{H}_2 (\text{g}) \rightleftharpoons 2\text{NH}_3 (\text{g}) + 23 \text{ kJ}$$
 - the temp. is increased, the equilibrium shifts to the _____ and the $[\text{H}_2]$ _____.
 - the press. is increased, the equilibrium shifts to the _____ and the $[\text{NH}_3]$ _____.
 - $[\text{H}_2]$ is increased, the equilibrium shifts to the _____ and the $[\text{N}_2]$ _____.
- For the following reaction, does the equilibrium shift to the left or to the right when...

$$\text{N}_2\text{O}_4 (\text{g}) + 57.2 \text{ kJ} \rightleftharpoons 2\text{NO}_2 (\text{g})$$
 - the press. is decreased, the equilibrium shifts to the _____ and the $[\text{N}_2\text{O}_4]$ _____.
 - the temp. is increased, the equilibrium shifts to the _____ and the $[\text{NO}_2]$ _____.
- For the following EXOTHERMIC reaction, does the equilibrium shift to the left or to the right when...

$$3 \text{ Fe} (\text{s}) + 4 \text{ H}_2\text{O} (\text{g}) \rightleftharpoons \text{Fe}_3\text{O}_4 (\text{s}) + 4 \text{ H}_2 (\text{g})$$
 - the press. is increased, the equilibrium shifts to the _____ and the $[\text{Fe}_3\text{O}_4]$ _____.
 - the temp. is decreased, the equilibrium shifts to the _____ and the $[\text{H}_2]$ _____.