**Solutions, Acid, Base Study Guide**

*The Solutions, Acid, and Base Mastery Quiz will be on Wednesday, April 20th. It will consist of 20 multiple choice questions covering the topics below. You will not be able to use this study guide on the test; however, you will be given the NC Reference Table. This study guide will be counted as a participation grade and is due at the beginning of class on Tuesday, April 19th.*

**Topic 1: Properties and Types of Solutions**

1. List/describe the 3 colligative properties of solutions:

2. Describe unsaturated, saturated, and unsaturated solutions. (You will need to be able to pick out which is which based on graphs/charts)

3. Explain how you could increase the rate of dissolving in a solution.

4. What is the definition of a colligative property?

5. What does it mean to be immiscible? Miscible?

**Topic 2: Solutions Calculations (Molarity, Dilutions, Solubility Graphs)**

6. Be able to interpret solubility graphs. What do points above lines represent? Points on the lines? Points below the lines?

7. What is the molarity of a solution that contains 56 g of LiCl in 500 mL of water?

8. If a 400 mL of a 6 M solution is diluted to 300 mL, what is the resulting concentration?

9. How many moles of calcium oxide are needed to make 3500 mL of a 7.8 M solution?

10. What volume of a 2.3 M solution can be made using 3.5 moles of calcium phosphate?

**Topic 3: Properties of Acids and Bases**

11. Determine if the following is an acid, base, salt, neither, or all:

a) HCl \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ f) turns litmus paper red \_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) NaOH \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g) turns litmus paper blue \_\_\_\_\_\_\_\_\_\_\_\_\_

c) MgCl2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ h) turns phenolphthalein pink \_\_\_\_\_\_\_\_\_

d) Ca(OH)2 \_\_\_\_\_\_\_\_\_\_\_\_\_ i) conducts electricity \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e) H3PO4\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ j) tastes sour \_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. What is the difference between concentration of an acid/base and strength of an acid/base?

13. Name/write formulas for acids and bases:

a) HNO3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g) Mg(OH)2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) HF \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ h) Cu(OH)3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c) H2PO3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ i) lithium hydroxide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d) Carbonous acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ j) tin IV hydroxide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e) hydrobromic acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_

f) Sulfuric acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14. What type of reaction occurs when an acid and a base react? Write a general equation.

15. What makes something an acid? A base?

**Topic 4: Acid and Base Calculations (pH, pOH, [H+], [OH-])**

16. Describe the pH scale (what is the range, which numbers are acid, which are base, etc)

17. Calculate the pH of a lithium hydroxide solution with a [OH-] of 7.6 x 10-4 .

18. What is the [H+] of a solution with a pOH of 13.5?

19. If the hydrogen ion concentration of a solution is 4.0 x 10-9, is the solution acidic, alkaline (basic), or neutral?

20. If a solutions has a pH of 4.5, what is the [OH-] ?

21. What is the concentration of NaOH needed to neutralize 500 mL of a 4.3 M HCl. Assume 35 mL of NaOH is needed for the neutralization.