

Name: \_\_\_\_\_

Period: \_\_\_\_\_

Seat#: \_\_\_\_\_

**Directions:** Any worksheet that is labeled with an \* means it is suggested extra practice. We do not always have time to assign every possible worksheet that would be good practice for you to do. You can do this worksheet when you have extra time, when you finish something early, or to help you study for a quiz or a test. If and when you choose to do this Extra Practice worksheet, please do the work on binder paper. If we end up with extra class time then portions of this may turn into required work. If that happens you will be told which problems are turned into required. Remember there is tons of other extra practice on the class website...and the entire internet! See me if you need help finding practice on a topic you are struggling with.

- **Show work for ANY math problem and include ALL units.**
  - **Some answers provided at the end of the question. The answers are underlined.**
- 1) Why doesn't NaCl dissolve in nonpolar solvents such as hexane C<sub>6</sub>H<sub>14</sub>?
  - 2) Is the supersaturated solution of sodium acetate a stable solution? Explain.
  - 3) A solution is made by dissolving 13.5g of glucose (C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>) in 0.100kg of water. What is the mass percentage of solute in this solution? 11.8%
  - 4) A 2.5g sample of ground water was found to contain 5.4µg (find in your book) of Zn<sup>2+</sup>. What is the concentration of Zn<sup>2+</sup> in parts ppm? 2.16ppm  
Indicate the type of solute-solvent interaction in each of the following solutions. (polar dissolves polar or nonpolar dissolves nonpolar)
    - a. salt in water
    - b. CCl<sub>4</sub> in benzene (C<sub>6</sub>H<sub>6</sub>)
    - c. KCl in water
  - 5) Calculate the mass percentage of Na<sub>2</sub>SO<sub>4</sub> in a solution containing 10.6g of Na<sub>2</sub>SO<sub>4</sub> in 483g of water 2.15%
  - 6) Seawater contains 0.0079g Sr<sup>2+</sup> per kilograms of water. What is the concentration of Sr<sup>2+</sup> in ppm? 7.9ppm
  - 7) A sulfuric acid solution contains 853.2g of H<sub>2</sub>SO<sub>4</sub> per 3L of solution. Calculate the molarity of H<sub>2</sub>SO<sub>4</sub> in this solution? 2.90M
  - 8) Ascorbic acid (vitamin C C<sub>6</sub>H<sub>8</sub>O<sub>6</sub>) is a water-soluble vitamin. A solution is made by taking 80.5g of ascorbic acid and dissolving it in 210g of water. This solution has a density of 1.22g/mL
    - a. Calculate the mass percentage. 27.7%
    - b. Calculate the molarity 1.9M
  - 9) Calculate the number of moles in the solutions below.
    - a. 600mL of 0.250M SrBr<sub>2</sub>. 0.15mol
    - b. 865mL of 0.154M NaCl. 0.133mol
    - c. 1L of 0.180M KCl.
    - d. 2L of 0.230M Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>.
  - 10) Commercial nitric acid is 16M. How many milliliters of this solution do you have if you have 2 moles of nitric acid in solution? 125mL
  - 11) Describe how you would prepare the aqueous solutions below starting with solid KBr
    - a. 0.75L of 1.5 x 10<sup>-2</sup> M KBr
    - b. 125g of a 0.180M KBr solution.
  - 12) What is the difference between 0.50mol HCl and 0.50M HCl?
  - 13) Calculate the molarity of a solution that contains 0.0250 mol NH<sub>4</sub>Cl in exactly 500mL of solution? 0.05M
  - 14) How many moles of NH<sub>4</sub>Cl are present in 2L of the molar solution in problem 2? 0.1moles of NH<sub>4</sub>Cl
  - 15) What is the molarity of a 200mL solution with 220 grams of NaOH? 2.75 M
  - 16) If you dissolve 1 mole of NaCO<sub>3</sub> into 250mL of solution, how many grams do you have of NaCO<sub>3</sub> per liter?(use density of water) 332grams/liters
  - 17) 1000g of drinking water contains 1.5x10<sup>-5</sup>g of lead. What is the ppm of the solution? 0.015ppm
  - 18) 100 milligrams of lake water were tested and found to contain 4.42x10<sup>-7</sup>g of potassium. What is the ppm of potassium in the water? 4.42ppm
  - 19) If I have 150mL of a 5M NaCl solution how many grams of NaCl do I have in the solution? 43.83g
  - 20) How many moles of copper are in two liters of a 5grams per liter solution of copper? 0.157moles
  - 21) If I add 1 L H<sub>2</sub>O to a 1 L of 1 M solution HCl, what is the molarity of the diluted solution? 0.5 M
  - 22) If I add 25 mL of water to 125 mL of a 0.30 M NaCl solution, what will the molarity of the diluted solution be? 0.25 M

## Dougherty Valley HS Chemistry Solutions – Extra Practice

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23) If I add water to 200 mL of a 0.15 M NaOH solution until the final volume is 300 mL, what will the molarity of the diluted solution be? 0.1 M

24) How much 0.05 M HCl solution can be made by diluting 250 mL of 10 M HCl? 50000 mL or 50 L

25) I have 345 mL of a 1.5 M CaCl<sub>2</sub> solution. If I boil the water until the volume of the solution is 250 mL, what will the molarity of the solution be? 2.07 M

26) How much water would I need to add to 500 mL of a 2.4 M MgCl<sub>2</sub> solution to make a 1.0 M solution? 1.2 L

27) If I leave 750 mL of 0.50 M sodium chloride solution uncovered on a windowsill and 150 mL of the solvent evaporates, what will the new concentration of the sodium chloride solution be? 0.625 M

28) Calculate the volume to which 500mL of 0.02M copper sulfate solution must be diluted to make a new concentration of 0.001M. 10000 mL or 10 L

### WORD SEARCH

- Fill in the blanks and find the keywords in the word search.
- Words can be written left to right, right to left, up to down, down to up.
- There are common letters.
- Find the hidden sentence that is composed of unused letters.

C O N C E N T R A T E D  
N T S O L V E N T H N I  
O E S O E L L U T I D S  
I O N W C H B I C E O S  
T H D Y T O I H U T T O  
A N I E R E C E D U H L  
Z A L L O Y S A I L E U  
I S U I L N I T C O R T  
N H T E Y M M I S S M I  
O T E R T P O L A R I O  
I A Q U E O U S Y Y C N

The component in smaller proportion is called .....

the compound in larger amount is called .....

.....**solution** is any solution having water as solvent

An .....is a homogeneous solution of two or more elements, including at least one metal.

.....is the mixing of a solute in a solvent.

Any process, producing ions, is called .....

Liquids, mix in all proportion, are called .....

.....solute dissolve in polar solvents.

Exothermic process produces .....energy

.....process absorbs heat energy

A solution which conducts electricity is called .....

Solutions that contain relatively large amount of solute are called .....

Solutions that contain relatively small amount of solute are called .....

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### Web Quest:

#### **Part 1: Components of Solutions**

<https://tinyurl.com/ojhnjjd>



- 1) What are the two parts of a solution?
- 2) Define a solute:
- 3) Define solvent:
- 4) Define solubility:
- 5) What is equilibrium in chemistry?

#### **Part 2 : Concentration**

<https://tinyurl.com/b8e8of3>



- 6) The concentration of a solution represents the (6a)\_\_\_ of (6b)\_\_\_ (6c)\_\_\_ in a unit amount of (6d)\_\_\_ or of solution.
- 7) Concentrated solutions have a (7) \_\_\_ amount of solute.
- 8) Diluted solutions have a (8)\_\_\_ amount of solute.

#### **Part 3 : Saturated and Unsaturated**

<https://tinyurl.com/wyqdpl0>



- 9) Describe an unsaturated solution:
- 10) Describe a saturated solution:
- 11) Describe a supersaturated solution:
- 12) What happens when you add more solute to an unsaturated solution?
- 13) What happens when you add more solute to a saturated solution?

#### **Part 4: Calculating Concentration**

<https://tinyurl.com/umcqfrk>



- 14) Do questions 1-4 in the above quiz.

#### **Part 5: Water as a solvent**

<https://tinyurl.com/z69s8vb>



- 15) Why is water called a “universal solvent”?
- 16) What makes water an excellent solvent?
- 17) How do water and our kidneys work together?

#### **Part 6: Solubility**

<https://tinyurl.com/dy743xz>



- 18) What are the five factors that affect solubility?
- 19) How is solubility affected by temperature?
- 20) Define polarity:
- 21) How does polarity affect solubility?
- 22) What is the aphorism used by chemists to describe polarity?

#### **Part 7: The dissolving process**

<https://tinyurl.com/oeb54ey>



- 23) Watch the following video. Explain how an ionic compound such as NaCl will behave in water compared to a covalent compound such as sugar.