

Solutions Worksheet #1: Molarity

1) Complete the table:

	Solute formula	Molar Mass of solute (g/mole)	Mass of Solute (g)	Moles of solute (mole)	Molarity of solution (M)	Volume of solution (L)
a	NaCl				1.0	1.0
b	NaOH		117.0			4.0
c	MgCl ₂		190.3			2.0
d	NaCl		292.5		0.5	
e	KBr		238.0		2.0	
f	NaCl				1.5	1.0
g	NaCl				1.0	0.25
h	FeCl ₃				0.1	0.50
i	HCl		438.0			2.0
j	NH ₃		39.1		3.0	

2) Calculate the number of moles and the number of grams of solute in each solution:

		Moles of solute (mol)	Molar Mass of solute (g/mol)	Mass of solute (g)
a	1.0 liter of .5 M NaCl			
b	500.0 mL of 2.0 M KNO ₃			
c	250.0 mL of .10 M CaCl ₂			
d	2.0 liters of .30 M Na ₂ SO ₄			

3) Compute the mass of solute needed to make 500.0 mL of solution at the indicated molarity.

- | | |
|---------------------------|---------------------------|
| a: 0.5M sulfuric acid | e: 0.1M iron III chloride |
| b: 0.01M HNO ₃ | f: 3M NH ₃ |
| c: 6.0M HCl | g: 5.0M KOH |
| d: 0.50M sodium hydroxide | |

4) How many moles of H₂SO₄ are in 1.00 liter of a 1.55M H₂SO₄ solution? How many grams?

5) How many grams of sodium sulfate are contained in 1.50L of .25M solution?

6) How many grams of ammonium sulfate are required to prepare 3.50L of a 1.55M solution?

7) How many moles of sodium chromate are contained in 1.75 L of a 2.00M solution?

8) A sample of glucose (C₆H₁₂O₆) is dissolved in water. How many moles of glucose are dissolved in 200.0 ml of solution if its concentration is .150M?

9) A mass of 98g of sulfuric acid are dissolved in water to prepare a .50M solution. What is the volume of the solution, in liters?

10) What is the molarity of a solution of HNO₃ that contains 12.6g of solute in 500ml of solution?

Name _____ Date _____ Period _____

Solutions Worksheet #2: Molarity and Dilution Problems

- 1) Describe how you would prepare 5.00 liters of a 6.00M solution of potassium hydroxide.
- 2) How would you prepare 100.0ml of .4M MgSO₄ from a stock solution of 2.0 MgSO₄?
- 3) If 1.00L of water is added to 3.00 L of a 6.00M solution of HCl, what is the new molarity of the acid solution?
- 4) What is the concentration when 50.0ml of 1.0M Na₂SO₄ is diluted to 500mL?
- 5) How would you prepare 4.0L of .5M sodium carbonate from a 10.0M solution?
- 6) You need 267 mL of .25M NaCl, but the only supply of NaCl you have is 1.75M NaCl. How do you prepare the required solution?
- 7) Describe how you would prepare 1.50L of a .25M solution of sodium sulfate.
- 8) Calculate the molarity of a solution containing 10.0 grams of sulfuric acid in 500 ml of solution.
- 9) Hydrogen peroxide solution for hair bleaching is usually prepared by mixing 5.0 go of hydrogen peroxide, H₂O₂, per 100.0 ml of solution. What is the molarity of this solution?
- 10) A chemist wants to dilute 50.0 ml of 3.50 M Sulfuric acid to 2.00 M Sulfuric acid. To what volume must it be diluted?

Solutions Worksheet #3: Electrolytes

Directions: Use the words provided to fill in the blank spaces below.

water	positive	electrolyte	negative	move
sugar	neutral	nonelectrolyte	ions	electric current
voltage	volts	electric charge	amps	sodium chloride

- 1) Substances that dissolve in water are classified according to whether they produce molecules or _____ in solution.
- 2) When an ionic compound dissolves, the _____ and _____ ions separate from each other and are surrounded by _____ molecules.
- 3) These solute ions are free to _____, making it possible for an _____ to pass through the solution.
- 4) Current is the flow of _____ which is measured in _____.
- 5) _____ is the push or pull of electrons in a wire measured in _____.
- 6) A substance that dissolves in water to give a solution that conducts electric current is called an _____.
- 7) _____ is an example of an electrolyte.
- 8) A solutions containing _____ solute molecules does not conduct electric current because it does not contain mobile charged particles.
- 9) A substance that dissolves in water to give a solution that does not conduct an electric current is called a _____.
- 10) _____ is an example of a nonelectrolyte

Directions: Complete the following table

	Solution concentration	Cation Formed	Cation Concentration	Anion formed	Anion Concentration	Total Ion Concentration
11)	1.0 M NaCl					
12)	1.0 M Al(OH) ₃					
13)	2.0 M NaOH					
14)	2.0 M MgBr ₂					
15)	0.10 M KCl					
16)	0.10 M K ₂ SO ₄					
17)	0.10 M K ₃ PO ₄					
18)	0.50 M LiCl					
19)	0.50 M CaCl					
20)	0.50 M C ₆ H ₆ O ₆					