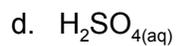


# Chemistry 20 - Unit C - Review Booklet

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

1. Identify the solvent and the solute in the following solutions
  - a. 18 mL of water in 38 mL of methanol
  - b. 0.283 g of sugar in 100 mL of water
2. Write dissociation equations for each of the following solid ionic compounds
  - a. Sodium sulfate
  - b. Calcium chloride
  - c. Zinc sulfate
  - d. Alumium sulfate
  - e. Magnesium iodide
3. Write ionization equations for each of the following compounds (acids....)
  - a.  $\text{HI}_{(g)}$
  - b.  $\text{HNO}_{3(aq)}$
  - c.  $\text{HClO}_{3(aq)}$



4. Write dissociation equations for the following ionic solids dissolving in water (bases....)

a. Sodium hydroxide

b. Potassium carbonate

c. Aluminium nitrate

5. Predict whether the following solutes will be electrolytes or nonelectrolytes

a. Potassium chloride

b. Hydrogen chloride

c. Carbon dioxide

d. Sulfur dioxide

6. Calculate the concentration of the following solutions

a. 29.8 g of NaCl in 250 mL of solution.

b. 49.29 g of  $C_{12}H_{22}O_{11}$  in 3.3 L of solution

7. Calculate the number of moles of solute needed to make the following solutions

a. 45.0 mL of 1.15 M KCl

b. 250.0 mL of 0.350 M  $CH_3COOH_{(aq)}$

8. Calculate the mass of solute needed to make the following solutions

a. 30.0 mL of 0.485 M  $Na_2CO_{3(aq)}$

b. 125 mL of 0.573 M  $Na_2S_{(aq)}$

9. Determine the concentration of the solution when

a. 50.0 mL of 1.95 M HCl is diluted to 115.0 mL

b. 250.0 mL of 1.48 M  $HNO_{3(aq)}$  is diluted to 750.0 mL

c. 50.0 mL of 7.90 M KOH is distilled to on 1.0 mL

10. Calculate the volume of the original solution needed to make the NEW solution

a. 2.50 M NaOH is used to make 490 mL of 1.23 M solution

b. 10.0 M AgNO<sub>3</sub> is used to make 990 mL of 2.38 M solution.

11. If 29.7 g of sodium chloride dissolves to make 200.0 mL of a saturated solution at 0C, what is the solubility of sodium chloride at 0C?

12. Use your solubility table to predict the solubility of the following solids

a. NaNO<sub>3</sub>

b. AgI

c. CuBr<sub>2</sub>

d. BaCl<sub>2</sub>

13. Predict what the precipitate will be, if any, when aqueous solutions of the following compounds are mixed.

a. lead(ii) nitrate with potassium sulfide

b. Sodium phosphate with calcium chloride

c. Ammonium acetate with mercury(i) nitrate

d. Zinc nitrate with lithium hydroxide

14. Define the following terms:

a. Acid solution

b. Base solution

15. The following properties were observed for 5 solutions. From the properties, identify the acids and bases (some might be neither).

<b>Solution</b>	<b>Conductivity</b>	<b>Taste</b>	<b>Reaction with Zinc Metal</b>	<b>Type of Solution</b>
V	Yes	Sour	Gas produced	
W	Yes	Bitter	None	
X	Yes	Salty	None	
Y	No	Sweet	None	
Z	Yes	Sour	Gas produced	

16. State the Arrhenius definition for an acid and base

17. Explain how a hydronium ion is formed in aqueous solution.

18. Calculate the  $[\text{OH}^-]$  in 0.050 M HCl solution

19. What is the pH of the solution in question 5.

20. Complete the following table:

Concentration of Hydronium ions		
	2.0	
$1.00 \times 10^{-11}$ M		
	8.00	
$1.0 \times 10^{-4}$ M		
		neutral
	12.00	
$1.0 \times 10^{-9}$ M		
	3.00	

21. Tomato juice has a pH of approximately 4.20. Find the  $[\text{H}_3\text{O}^+]$ ,  $[\text{OH}^-]$  and pOH of the tomato juice.

22. A solution of  $\text{Ba}(\text{OH})_2$  was prepared by adding 1.00 g into 1.00 L of water. Find the  $[\text{H}_3\text{O}^+]$ ,  $[\text{OH}^-]$ , pH and pOH of the solution.

23. Separate samples of a solution of unknown pH turn phenolphthalein pink, indigo carmine blue and 1,3,5 trinitrobenzene colourless. What is the pH of the solution?
24. Separate samples of a solution of unknown pH turn thymol blue yellow, methyl orange red and chlorophenol red. What is its pH?
25. Calculate the  $[H_3O^+]$ ,  $[OH^-]$ , pH and pOH of the solutions described below:
- A solution of HF diluted from 100 mL of 4.5M standard solution to a volume of 900 mL.
  - A solution of  $HNO_3$  created by adding 1.283 g of solid to 350 mL of water.
  - A solution of phosphoric acid diluted from 10 mL of 12.1 M solution diluted by adding 790 mL of solution.
  - A solution of  $Ba(OH)_2$  created by adding 0.39 g of solid to 15.00 L of solution.