

## Experiment 2 Prelaboratory Assignment

### Identification of a Compound: Chemical Properties

Date \_\_\_\_\_ Lab Sec. \_\_\_\_\_ Name Leo Desk No. \_\_\_\_\_

1. Experimental Procedure, Part A a. What is the criterion for clean glassware?

No water droplets should adhere to the inner surface of the glassware

b. What is the size and volume of a "small, clean test tube?"

size → 75 mm / volume → 3 mL

2. Experimental Procedure, Part A 2 Describe the technique for testing the odor of a chemical

The technique is waffing, you must put your hand above the test tube and in circular motion towards your face and nose, motion the movement and the wave of your hands to direct the air in the direction towards your face.

a. Depending upon the tip of a dropper pipet, there are approximately 20 drops per milliliter of water. What is the approximate volume (in mL) of one drop of an aqueous solution?

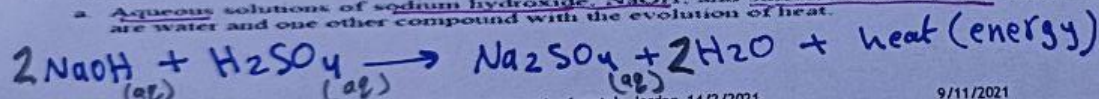
$$\begin{array}{l} 20 \text{ drops} \rightarrow 1 \text{ mL} \\ 1 \text{ drop} \rightarrow x \end{array} \rightarrow \frac{20}{20} x = \frac{1}{20} \rightarrow x = 0.05 \text{ mL} \rightarrow 0.05 \text{ mL per 1 drop}$$

b. A micropipet delivers 153 drops of alcohol for each milliliter. Calculate the volume (in mL) of alcohol in each drop.

$$\begin{array}{l} 153 \text{ drops} \rightarrow 1 \text{ mL} \\ 1 \text{ drop} \rightarrow x \end{array} \rightarrow \frac{153}{153} x = \frac{1}{153} \rightarrow x = 0.007 \text{ mL per 1 drop}$$

4. Write a balanced equation for the following observed reactions:

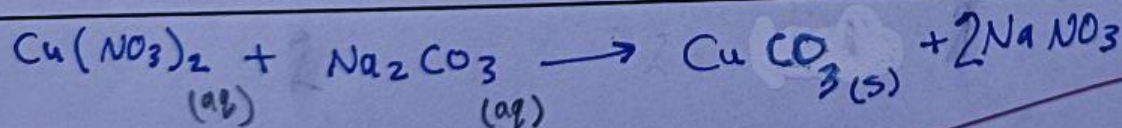
a. Aqueous solutions of sodium hydroxide, NaOH, and sulfuric acid, H<sub>2</sub>SO<sub>4</sub>, are mixed. The neutralization products are water and one other compound with the evolution of heat.



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b. Aqueous solutions of copper(II) nitrate, Cu(NO<sub>3</sub>)<sub>2</sub>, and sodium carbonate, Na<sub>2</sub>CO<sub>3</sub>, are mixed. A blue precipitate of copper(II) carbonate forms in addition to one other compound.



5. Experimental Procedure, Part A. The substances, NaCl, Na<sub>2</sub>CO<sub>3</sub>, MgSO<sub>4</sub>, and NH<sub>4</sub>Cl used for test solutions, are all

5. Experimental Procedure, Part A. The substances,  $\text{NaCl}$ ,  $\text{Na}_2\text{CO}_3$ ,  $\text{MgSO}_4$ , and  $\text{NH}_4\text{Cl}$  used for test solutions, are all soluble ionic compounds. For each substance indicate the ions present in its respective test solution.

$\text{NaCl}$ :  $\text{Na}^+ / \text{Cl}^-$   
 $\text{Na}_2\text{CO}_3$ :  $\text{Na}^+ / \text{CO}_3^{2-}$   
 $\text{MgSO}_4$ :  $\text{Mg}^{2+} / \text{SO}_4^{2-}$   
 $\text{NH}_4\text{Cl}$ :  $\text{NH}_4^+ / \text{Cl}^-$

ظاهرة بها ✓

6. Three colorless solutions in test tubes, with no labels, are in a test tube rack on the laboratory bench. Lying beside the test tubes are three labels: potassium iodide,  $\text{KI}$ , silver nitrate,  $\text{AgNO}_3$ , and sodium sulfide,  $\text{Na}_2\text{S}$ . You are to place the labels on the test tubes using only the three solutions present. Here are your tests:

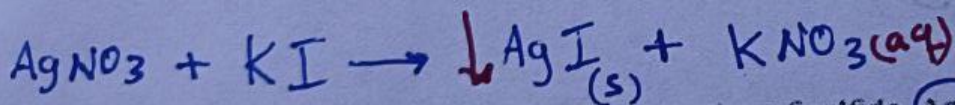
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 • A portion of test tube #1 added to a portion of test tube #3 produces a yellow, silver iodide precipitate.  
 • A portion of test tube #1 added to a portion of test tube #2 produces a black, silver sulfide precipitate.

a. Your conclusions are:

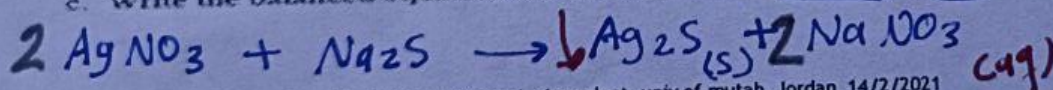
Test Tube 1	silver nitrate	$\text{AgNO}_3$
Test Tube 2	sodium sulfide	$\text{Na}_2\text{S}$
Test Tube 3	potassium iodide	$\text{KI}$

$\text{AgI}$   
 $\text{Ag}_2\text{S}$  ✓

b. Write the balanced equation for the formation of silver iodide,  $\text{AgI}$ .



c. Write the balanced equation for the formation of sulfide,  $\text{Ag}_2\text{S}$ .



precipitate  
ترسب

7. Refer to Appendix G and determine which of following salts are insoluble in water:

$\text{NaNO}_3$ ,  $\text{AgCl}$ ,  $\text{Mg(OH)}_2$ ,  $\text{NH}_4\text{NO}_3$ , and  $\text{Ag}_2\text{CO}_3$

soluble

soluble