

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

## Hydrates

### DATA SHEET

#### I. Hydrate test - Observations

##### A. Copper Sulfate

1. Before heating \_\_\_\_\_

2. After heating \_\_\_\_\_

3. Conclusions \_\_\_\_\_

##### B. Cobalt Chloride

1. Before heating \_\_\_\_\_

2. While heating \_\_\_\_\_

3. After heating \_\_\_\_\_

4. After adding water \_\_\_\_\_

5. Conclusion \_\_\_\_\_

#### II. Percent of water in hydrated magnesium sulfate

##### A. Data - Record the mass of the following

1. Empty dry crucible and cover \_\_\_\_\_

2. Crucible, cover and sample before heating \_\_\_\_\_

3. Crucible, cover and sample after first heating \_\_\_\_\_

4. Mass after second heating \_\_\_\_\_

##### B. Calculations

1. Initial hydrate weight \_\_\_\_\_

2. Anhydrous sample mass \_\_\_\_\_

3. Mass of water lost \_\_\_\_\_

4. Moles of anhydrous  $\text{MgSO}_4$  \_\_\_\_\_

5. Moles of water lost \_\_\_\_\_

6. Ratio of moles of  $\text{H}_2\text{O}$ :moles of  $\text{MgSO}_4$  \_\_\_\_\_ : 1

7. Molecular formula of hydrate \_\_\_\_\_

8. Name of hydrate \_\_\_\_\_

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### REVIEW QUESTIONS

1. The hydrated form of copper sulfate is  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ . How many grams of water could the anhydrous salt absorb if the following amounts were present:

0.5 mole  $\text{CuSO}_4$  \_\_\_\_\_

50 grams  $\text{CuSO}_4$  \_\_\_\_\_

2. If table salt were purchased by the pound, which would be a better buy; one that was lumpy or a fine powder? Why?

3. What color is copper sulfate before and after heating?

4. What would be one common use for cobalt chloride?

5. What is the molar mass of water?

6. Washing soda,  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ , is used in Europe for laundering clothes. What weight percent of the hydrate is water?

7. Five grams of an unknown hydrate of magnesium sulfate were weighed out. After much heating, 3.825 grams of the anhydrous salt remained.

- How many moles of water were driven off?
- How many moles of magnesium sulfate were in the anhydrous sample?
- What is the ratio of the moles of water to magnesium sulfate?
- What is the molecular formula of the hydrate?

8. After the final heating, why should the crucible be covered while cooling for the final weighing?

9. Why did you slant the test tube downward when you heated copper sulfate?