Name:_____

Decomposition Reactions

Part #1: Copper(II) Sulphate Pentahydrate (bluestone) ➜ $CuSO_4 \bullet 5H_2O$	
mass of clean dry empty test tube	
mass of test tube plus copper(II) sulphate pentahydrate	
mass of test tube plus copper(II) sulphate residue	

Observations during heating:

Obseravtions when water was added back:

Part #2: Cobalt(II) Chloride Hexahydrate ➜ $CoCl_2 \bullet 6H_2O$	
mass of clean dry empty test tube	
mass of test tube plus cobalt(II) chloride hexahydrate	
mass of test tube plus cobalt(II) chloride residue	

Observations during heating:

Obseravtions when water was added back:

Perform the Following Calculations For $CuSO_4 \bullet 5H_2O$:

1. Write a balanced chemical equation for this reaction:

2. Calculate the mass of $CuSO_4 \bullet 5H_2O(s)$ that is available to react:

   mass $CuSO_4 \bullet 5H_2O(s)$ = (mass t.t. plus $CuSO_4 \bullet 5H_2O(s)$ – (mass t.t.)

   mass $CuSO_4 \bullet 5H_2O(s)$ =

   mass $CuSO_4 \bullet 5H_2O(s)$ =

3. Predicted mass of $CuSO_4$ residue that should remain after heating (three conversion factors starting with the mass of $CuSO_4 \bullet 5H_2O(s)$

   This is called the **"Theoretical Mass"** of $CuSO_4$

4. **"Experimental Mass"** of $CuSO_4$ residue that remains after heating

   mass $CuSO_4(s)$ = (mass t.t. plus $CuSO_4$ residue) – (mass t.t.)

   mass $CuSO_4(s)$ =

   mass $CuSO_4(s)$ =

5. Experimental Error Calculation:

$$\% \text{ error} = \frac{|\text{theoretical mass} - \text{experimental mass}|}{\text{theoretical mass}} \times 100\%$$

Reapeat the Calculations from the previous page for $CoCl_2 \bullet 6H_2O$

Questions – attach a separate sheet with the answers. (Please answer in full sentences ...)

1. Give a good definition for an "exothermic reaction".

2. Give a good definition for an "endothermic reaction".

3. Identify the exothermic reactions in the procedure that you followed for these two decompositions. How do you know that these reactions were exothermic?

4. Was the decomposition of $CuSO_4 \bullet 5H_2O$ and/or $CoCl_2 \bullet 6H_2O$ exothermic or endothermic. Explain using two distinct points.

5. What are some possible sources of error in this experiment. Explain that the effect of this error could have on the final mass of residue obtained (i.e. would the mass become more or less).