PERCENT OF WATER IN A HYDRATE   Name _____   Period ____
AND THE FORMULA OF A HYDRATE

Objective: To find the percent of water in barium chloride hydrate and to find its
formula.

Procedure: *Goggles and aprons MUST be worn!*
1. Thoroughly wash a crucible and cover. From this point, handle it with a crucible tongs only.
2. Heat the crucible with the cover slightly open for 5 minutes to dry completely. The bottom of the crucible should be red hot.
3. Allow the crucible and cover to cool on the metal base. Do not touch with your hands!
4. After the crucible is cool, find the mass of the crucible and cover. Record its mass in the data table below. (Line 1)
5. Add 1 level spatula spoon of barium chloride hydrate and find its total mass. (Line 2)
6. Heat the crucible, cover, and contents with the cover slightly open. After the bottom is red hot, heat it for 10 minutes.
7. Allow the crucible, cover, and anhydrous barium chloride to cool on the metal base.
8. Find the mass of the crucible, cover, and anhydrous barium chloride. (Line 4)

Data table: *Show the steps for computations!*
1. Mass of empty crucible and cover   _____ g
2. Mass of crucible, cover, and barium chloride **hydrate**   _____ g
3. Mass of barium chloride **hydrate**   _____ g
4. Mass of crucible, cover, and **anhydrous** barium chloride _____ g
5. Mass of **anhydrous** barium chloride   _____ g
6. Mass of water lost by heating   _____ g

7. Experimental percent of   = Line 6 X 100%   _____ %
   water in barium chloride hydrate   Line 3

8. Theoretical percent of water in barium chloride hydrate _____ %
   Do this calculation after completing the back of this lab

9. Experimental error = Experimental % - Theoretical %   _____ %

10. Percent error = Experimental error X 100%   _____ %
                    Theoretical percent

FIND THE FORMULA OF THE HYDRATE:

The general formula of the hydrate is: $BaCl_2$ X ? H_2O

To write the formula, calculate the mole ratio $= X = \dfrac{\text{moles of } H_2O}{\text{moles of } BaCl_2}$

1. Find the number of moles of water. (Convert the mass of water in Line 6 to moles).

2. Find the number of moles of anhydrous barium chloride. (Convert the mass of barium chloride in Line 5)

3. Find X, using the formula above. Round the result to the nearest whole number. This will give you the coefficient for the hydrate.

4. Write the formula: $BaCl_2$ X ____ H_2O