AP Chemistry Lab
Formula of a Hydrate

Pre-Lab Questions
1. What is a hydrate?

2. What is a crucible?

3. When heating with a Bunsen burner, what is the hottest part of the flame?

4. What is an anhydrous salt?

5. Why is a crucible made of such a delicate material as porcelain?

Procedure
1) If anything used in this lab is too hot to touch, don't touch it.

2) Wash a crucible and cover with soap and a brush, rinse, and dry with a paper towel.

3) Set the cleaned crucible and cover on a triangle and ring on a ring stand and heat with a Bunsen burner. The cover should be askew. Heat with an intense heat so that the bottom of the crucible becomes red. Using tongs, remove the cover and then the crucible from the ring and let them cool with the cover askew on a hot-pad on your lab desk.

4) Find the mass of the dry crucible and cover.

5) Record the name of your hydrate on the data table. Add this hydrate to the crucible until it is about 1/3 full. Find the mass of the crucible, hydrate and cover.

6) Place the crucible on the triangle and ring and heat gently (cover askew) for about five minutes to drive off most of the water. Then heat intensely for about five minutes to drive off the rest of the water. Then heat intensely for another five minutes.

7) At the end of the heating, using tongs, place the crucible, contents, and cover (askew) on the hot-pad to cool. You may wish to place the lid on properly to keep it from falling while moving the crucible. It can then be placed askew again.

8) When the crucible is cool enough to hold in your hand, find the mass of the crucible, cover, and anhydrous salt. Clean the crucible and repeat until you have three good trials.

Sample Data Table

	Trial 1	Trial 2	Trial 3
Mass of crucible and cover			
Mass of crucible, hydrate and cover (before heating)			
Mass of crucible, anhydrous salt and cover (after heating)			

Post Lab Questions

The Post Lab questions can be answered in a table format.

1) Determine the mass of the anhydrous salt alone (that is, without the crucible and cover).

2) Determine the number of moles of anhydrous salt present in the crucible.

3) Determine the mass of the water lost by the hydrate to produce the anhydrous salt. (Hint: the difference in the mass between two of the three items in the data table may yield the easiest method of finding the mass of the water lost.)

4) Determine the number of moles of water lost.

5) Find the ratio of moles of water lost to moles of anhydrous salt.

6) For purposes of this experiment assume that the moles of water in the formula of the hydrate is a whole number. Therefore, round the answer in item #5 above to the nearest whole number.

7) Write the formula of the hydrate _____ x H_2O.

8) Your teacher will provide you with the accepted value for X. Find the percentage error.

9) Create data for a fourth trial to show what would happen to the value of X if you did not drive off all the water in the crystal.

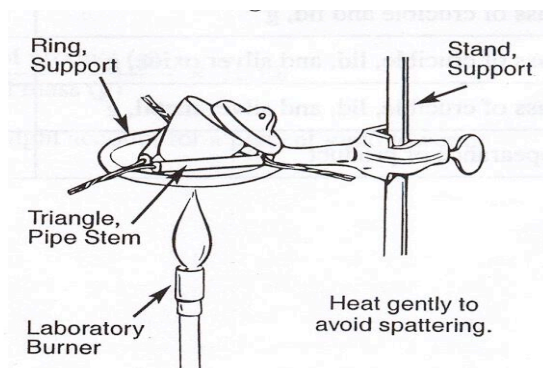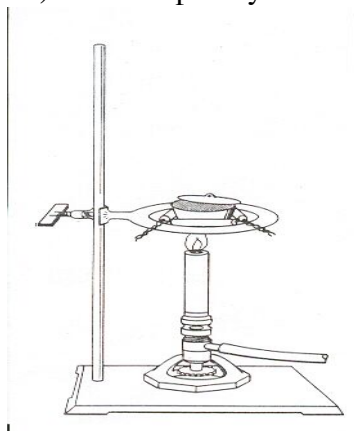10) Please explain your answer to number 9 in detail in a separate paragraph also.

Figure 2.