

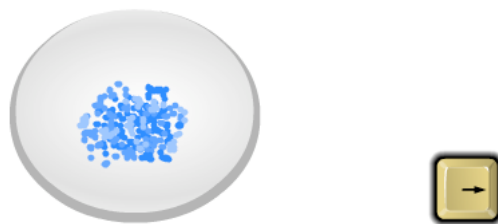
Heating a Hydrate

Name _____ Lab Section _____

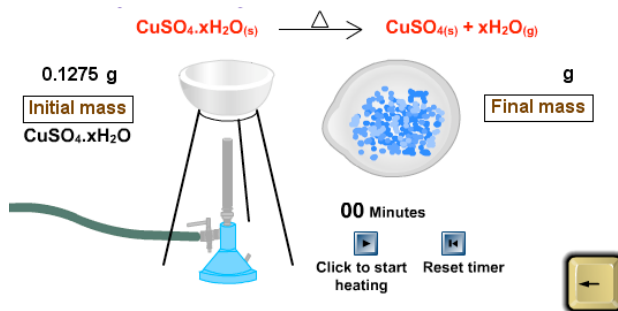
Problem Statement: What happens to the mass of a hydrate when it is heated?

I. Data Collection:

- A. Go to <http://cheminfo.chem.ou.edu/~mra/home.html> and open the Heating a Hydrate Simulation. Your screen should look like the figure below. Showing is a container of the compound hydrated copper(II) sulfate, $\text{CuSO}_4(\text{H}_2\text{O})_x$ - also written $\text{CuSO}_4 \cdot x\text{H}_2\text{O}$.



Click on the arrow button to advance to the second screen. Your screen should now look like the figure below.



The apparatus represents a crucible that contains a measured amount of hydrated copper(II) sulfate. The equation for the reaction is displayed. By clicking on the start button you can heat the hydrated copper(II) sulfate and observe what happens.

B. Go to the second screen and click on the start button. Record your observations below.

C. Write the chemical equation for the reaction you observed. Record the initial and final mass of the substance in the container.

D. Click on the return button to go back to the first screen. Then click on the advance button to return to the second screen. Click on the start button to collect a second set of data. Repeat this process until you have six sets of data. Record these data in the table below.

Initial Mass	Final Mass	Change in Mass

II. Data Analysis Interpretation and Conclusions

A. What chemical substance is represented by the initial mass? What chemical substance is represented by the final mass? What chemical substance is represented by the change in mass?

- B. Plot a graph of the initial mass by the change in mass and determine the equation of the line. Record your results below. Include the graph in your report. (If you have a straight line you can use the equation for a straight line ($y = mx + b$). If the line is a curved line you can test to see if the plot is a power function ($y = x^2$) or a logarithmic function ($y = \log x$). This can be made easier if you are using a graphing or data analysis program like ExcelTM. Your instructor can show you how to do this.)
- C. Rewrite the equation to represent the mass relationships between chemical substances. (substitute chemical formulas for x and y.) What does the slope of the line represent.
- D. Determine the value for x in the formula $\text{CuSO}_4(\text{H}_2\text{O})_x$. (Remember that x is numbers of particles not mass.)