

Empirical Formula Lab

Intro

In this lab you will determine the empirical formula for a compound containing two elements. One of the elements will be called M. It's atomic mass is 74.6 g/mol. The other element composing this compound is Oxygen.

Procedure

- 1) Weigh out enough of the Mystery Compound to cover the bottom 1.5 cm of a test tube. (ex. Weigh the test tube, put in some mystery compound and weigh the test tube again.)
- 2) Clamp the test tube to the ring stand and point the mouth at an angle away from other people and yourself.
- 3) Using a gentle, low temperature, blue flame heat the test tube. You should see the substance look like it is boiling. However it's not actually boiling. The substance is decomposing. Heat from the Bunsen burner is driving off the oxygen, leaving only the other element M.
- 4) When the substance has been bubbling vigorously for one minute, blow out a flaming splint so that there is a glowing ember at the end and insert it into the test tube. (Do not drop the splint into the tube.)
- 5) Is oxygen being produced? How do you know?

- 6) Heat the test tube until there is no more gas escaping. (You should see the bubbling stop.) Then heat it for another three minutes under the hottest flame you can muster. Be sure to heat the test tube along its sides where some of the compound may still contain oxygen. However, be careful not to melt the clamp.
- 7) Let it cool so that it can be handled without burning yourself.
- 8) Reweigh the test tube to determine the amount of oxygen that has left the tube and the amount of M remaining.
- 9) Wash out the test tube and put all three of your mass measurements on the board: test tube, test tube and substance, test tube and substance after heating.

Calculations

Given your above data, you should be able to calculate the formula for the unknown compound. It will be in the form:



You need to determine x and y, so that we can write the formula with the correct ratio of M atoms to O atoms.