Molecular weight of a condesable vapor

ASSIGN BUSTER

AP Chemistry Period 1 Molecular Weight of a Condensable Vapor Lab Purpose: The purpose and objective of this lab was to find the molecular weight of a condensed vapor. Materials and Equipment: •Aluminum foil square (around 6cm on a side) •125 mL flask •Barometer •3 mL of unknown liquid •200 mL graduated cylinder •600 mL beaker •Pin •Balance (0. 002g) •Bunsen Burner setup •Rubber band •Thermometer •Ceramic center wire gauze Procedure: 1. A 125 mL flask was obtained. The square of aluminum was fashioned over the flask by laying the foil over the mouth and folding the sides down.

A pin was then obtained and was used to poke a tiny hole in the center of the aluminum cap. 2. Next, the mass was determined of the clean, dry flask with the cap to 0. 001 g. 3. 3 mL of the unknown liquid was obtained and was poured into the flask. Afterwards the flask cap was replaced securely. 4. Then, a 600 mL beaker was then filled nearly full of water. The beaker was then heated to a boil over the Bunsen burner setup. 5. Once the water reached a boil, the temperature was then recorded and the barometric pressure.

Then the flask was clamped at the very top and was suspended to the beaker. 6. The flask from the beaker was not removed and the flask was examined for excess vapor coming out through the pin hole to see a refraction effect. 7. When all of the liquid evaporated, the flask was removed by holding the clamp and set aside to cool. 8. Next, the flask was wiped down until it was completely dry. 9. Then, the mass of flask, cap, and unknown condensed liquid was found. 10. The flask was filled completely full with water.

The flask was then poured into a graduated cylinder and measured the volume. 11. Next, all the materials and chemicals were cleaned up. 12. Once the area was clean, the calculations could be completed. Observations: The flask inside the beaker full of water was being examined. As the water surrounding the flask began to boil, droplets started to form on the inside of the flask. After a while, nothing could be seen forming in the flask. When this happened, the droplets evaporated and inside the flask was the condensed vapor. Calculations: 1. Questions: 2.

What does the flask contain? a. The flask contains air before adding the volatile liquid. b. The flask contains all vapor at the point when the volatile liquid has completely vaporized. c. The flask contains condensed vapor and air at the end of the experiment and at the final weighing. 3. Why is the temperature of boiling water used for measuring the volume of the vapor instead of the temperature of the liquid after it has cooled to room temperature? Instead of taking the temperature of the gas, the temperature of the boiling water was taken and was transferred. . When vaporized, the volatile liquids used in this experiment do not behave exactly as ideal gases. How would this tend to affect your calculated molecular weight? The molecular weight was smaller than expected. This happened because the density was smaller due to the mass being smaller and this meant too much vapor escaped the flask. Conclusion: In this experiment, the molecular weight of a condensed vapor was found through a procedure using an unknown liquid. The flask before adding the unknown liquid in was full of air.

After the beaker full of water started to boil the flask was examined until the unknown liquid was completely vaporized. At that exact point the flask

contained all vapor. At the final weighing the flask contained condensed vapor and air. There is always a chance for error. Some sources of error could have come with completing this lab over an open water bath and some water vapor may have been in place. Also, too much vapor could have escaped and the experiment might not have been stopped quick enough.