

Molecular Weight of Liquid Online Lab Submission

Name: Kevin Zhang

Class: Chem 1212

Section: Mondays, 10:30 AM – 1:25 PM

Report Sheet

	First Experiment	Second Experiment
Unknown Number	895	--
Weight of Dry Apparatus	64.278g	64.278g
Weight of Dry Apparatus plus condensed vapor	64.544g	64.547g
Weight of condensed Vapor	0.266g	0.269g
Total Volume of Flask (mL)	150mL	150mL
Total Volume of Flask (L)	0.150 L	0.150 L
Barometric pressure (mmHg)	766 mmHg	766 mmHg
Barometric pressure (atm)	1.01 atm	1.01 atm
Temperature of Vapor (°C)	100.2°C	100.2°C
Temperature of Vapor (°K)	373.4°K	373.4°K
Molecular Weight of Liquid (g/mole)	53.8 g/mol	54.4 g/mol
Average Molecular Weight	54.1 g/mol	--

Pre-Lab Questions

1. Vapor is the gaseous form a liquid that has just been boiled away.

$$2. M = \frac{gRT}{PV} = \frac{0.80 \times 0.08206 \times 373.2}{0.987 \times 0.280} = 88.7 g/mol$$

Post-Lab Questions

1. The pinhole is open to the atmosphere, meaning that the pressure inside the flask would be the current atmospheric pressure. Furthermore, the pinhole allows excess vapor to escape, leaving only the amount of vapor needed to fill the flask inside.
2. We are dealing with the same substance, and any excess vapor formed during the boiling process will simply leave the pinhole.
3. The flask was not completely dry before the experiment was done, and trace amounts of water vapor ended up inside the flask.
4. If the liquid vaporized at room temperature, it would more difficult to handle it as a liquid at room temperature, because it would vaporize away.
5. (c) The molecular weight would be unaffected by this error and it would be the correct value

$$6. \text{Experiment 1: } M = \frac{gRT}{PV} = \frac{(0.266+0.05) \times 0.08206 \times 373.4}{1.01 \times 0.150} = 63.9 g/mol \text{ Experiment}$$

$$2 : M = \frac{gRT}{PV} = \frac{(0.269+0.05) \times 0.08206 \times 373.4}{1.01 \times 0.150} = 64.5 g/mol \text{ New Average:}$$

$$64.2 g/mol$$