

## Lab-report # 6

Date: 97-11-21 Time: 12.50 – 14.20

### *How to find the molar mass of the gas in a lighter:*

#### Work to be done:

- To find out the molar mass of an element you have to find out the mass and volume.

#### Chemicals and apparatus:

- Common lighter
- Bowl
- Cylinder with scale
- A scale

#### Lab:

In this lab I needed two formulas. First:  $n = m / M$ . Second:  $P V = n R T$ , where  $R = 8.31$ . I can combine these two to make one;  $P V = ( m / M ) R T$  or  $M = m R T / P V$ .

First I weighted the lighter ( $w_1$ ) to 16.98. Then I filled both the bowl and the cylinder with water and turned the cylinder upside-down IN the bowl so that the cylinder still is filled with water.

I then putted the lighter under the cylinder in the water and started to empty the lighter of the gas, so that the gas was collected in the cylinder. After a while I could measure the volume of the gas to  $250 \text{ cm}^3$ .

I then dried and weighted the lighter again. Now the mass was 16.40. This may not be accurate because the lighter may contain some water.

This means that  $250 \text{ cm}^3$  gas weights 0.58g. Now, let's put the digits into the formula:

$$M = \frac{mRT}{PV}$$

$$M = \frac{0.58 * 8.31 * 293.75}{102.6 * 0.25} = 55.2$$

Since there is no gas that has the molar mass of 55.2, but Butane that has 58, I would say that the lighter contains primary Butane, and some other gases.