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Date 2/31/2007

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Section 02134

Experiment 1

Are the Densities of Coke and Diet Coke Different?

Objectives:

To learn how to use pipettes, burettes, and graduated cylinders.

To learn how to use an analytical balance.

To measure and compare the densities of Coke and Diet Coke and verify that density is an intensive property.

Part 1

Are the Densities of Coke and Diet Coke Different?

Sample 1 used: Coke

Sample Temperature: 21.7 °C

| | Pipette | | Grad. Cylinder | | Burette | |
|------------------------------------|---------|---------|----------------|---------|---------|---------|
| | Trial 1 | Trial 2 | Trial 1 | Trial 2 | Trial 1 | Trial 2 |
| Mass of Empty Beaker (g) | 25.6905 | 26.8801 | 30.2965 | 28.3715 | 27.7561 | 28.4398 |
| Mass of Beaker + Liquid Sample (g) | 30.8925 | 32.0561 | 35.4533 | 33.5427 | 32.8800 | 33.4878 |
| Mass of Liquid Sample (g) | 5.2020 | 5.1760 | 5.1568 | 5.1712 | 5.1239 | 5.0480 |
| Volume Delivered (ml) | 5.00 | 5.00 | 5.01 | 4.98 | 5.02 | 5.00 |
| Calculated Density (g/ml) | 1.0404 | 1.0352 | 1.0293 | 1.0384 | 1.0207 | 1.0096 |

Sample density calculation:

Pipette, Trial 1: Mass of liquid = $30.8925 - 25.6905 = 5.2020$

Density = mass / volume

Density = $5.2020 / 5.00$

Density = 1.0404 g/ml

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Class Average Data for Part 1:

| Sample | Average Density \pm Standard Deviation (g/ml) | | |
|-----------|---|-----------------|-------------------|
| | Pipette | Grad. Cylinder | Burette |
| Coke | 1.041 \pm 0.006 | 1.04 \pm 0.02 | 1.03 \pm 0.01 |
| Diet Coke | 0.995 \pm 0.003 | 0.97 \pm 0.05 | 0.980 \pm 0.003 |

Part 2

Does the size of the sample affect the density?

Sample I used: CokeVolume assigned: 18 ml

| | Trial 1 | Trial 2 |
|------------------------------------|---------|---------|
| Mass of Empty Beaker (g) | 22.4317 | 20.9840 |
| Mass of Beaker + Liquid Sample (g) | 41.2687 | 39.5016 |
| Mass of Liquid Sample (g) | 18.8370 | 18.5176 |
| Volume Delivered (ml) | 18.22 | 17.95 |

| Sample | Density (g/ml) determined from the plot |
|-----------|---|
| Coke | 1.033 |
| Diet Coke | 0.997 |

NOTE: All the numbers in this sample report are made up and are not actual data. Do not expect your actual lab data to be the same as the numbers used here.