

Density of Soda - Coke vs. Diet Coke

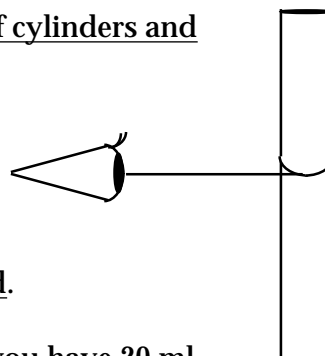
Part 1 - Data Collection

Introduction

In this lab we will be measuring density in a variety of ways through a comparison of Coke and Diet Coke.

Part A:

- 1) Work in pairs. Each person should have a copy of the data.
- 2) Put approximately 30ml of regular Coke in a 50 ml beaker.
- 3) You will be collecting data on the density of Coke by measuring several volumes and masses of those volumes.
- 4) Set up a table with two columns: Volume of Soda, Mass of cylinders and Soda.
- 5) Place two 10 ml graduated cylinders on a scale and measure their mass. Leave them both on the scale.
- 6) Using an eye dropper, add about 2ml of soda to one of the cylinders. **Do not spend a lot of time trying to add exactly 2 ml.** The important part of this is to precisely read the volume of the soda you actually added.
- 7) Then record your volume and mass.
- 8) Repeat steps 5 and 6, adding about 2ml each time. Until you have 20 ml of soda in your graduates. Be careful not to put more than 10ml in one of the cylinders.
- 9) Repeat this entire process for Diet Coke.
- 10) Clean all glassware and eyedroppers.



Part B:

- 1) Record the volume of a Coke can. This is printed directly on the can.
- 2) Record the mass of an empty Coke can.
- 3) Record the mass of a full Coke can.
- 4) Repeat this process for a can of Diet Coke
- 5) Calculate the density of Coke and Diet Coke. Remember to use only the mass of the liquid in your calculation of density.

Part C:

Record your observations of the cans of Coke and Diet Coke in the bucket of water.

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Part 2 - Problems and Questions

Problems:

- 1) Determine the density of soda from the full can of regular Coke. Show work.
- 2) Determine the density of soda from the full can of Diet Coke. Show work.
- 3) Construct a separate graph for each set of data: regular and Diet Coke. Refer to "Good Graphing" when making these graphs. Place mass of soda data along the y axis and volume data along the x axis. (Don't forget the masses you recorded include the mass of the cylinders.)
- 4) Calculate the density by finding the slope of the line on the graph of the regular Coke data. Show work. (Be sure to refer to #10 on "Good Graphing")
- 5) Calculate the density by finding the slope of the line on the graph of the Diet Coke data. Show work. (Be sure to refer to #10 on "Good Graphing")

Questions:

- 1) The density of pure water is 1.00 g/cm^3 . Use this information to explain what you saw in **Part C** of the lab. In your explanation, refer to your calculated densities for regular and diet Coke from the problem section of this sheet.
- 2) Compare the densities of soda you determined with the graph and slope method to the full can method. Which method do you think is more accurate? Explain why.