

DIET OR REGULAR? PERCENT OF SUGAR IN BEVERAGES

PURPOSE

Determine if the sugar (fructose) in several commercial beverages is as stated on the container.

BACKGROUND INFORMATION

At the forefront of the diet or regular debate is a molecule composed of 6 carbon atoms, 12 hydrogen atoms and 6 oxygen atoms: $C_6H_{12}O_6$ also known as fructose. The sugar most often used in carbonated beverages. How could you determine the sugar content of your favorite beverage? Chemists often measure a quantity by indirect means-measuring a related property and then comparing that to the values for prepared standards. For sugar the most easily related property is density.

Along with adding calories to a beverage, dissolved sugar also increases the density. In this activity, you will determine the density of five known sugar solutions. You will then plot these densities on a density vs. sugar content graph. You will then calculate the densities of your beverage and use the graph to determine the sugar content.

SAFETY NOTE

Never drink a beverage that has been opened in the laboratory or has been put in laboratory glassware. Discard all solutions down the drain. Wear goggles and a laboratory apron during this activity.

MATERIALS

1 to 4 beverages
5 ml pipet and bulb
100 ml beaker
electronic balance

five standard sugar solutions
(0%, 5%, 10%, 15%, & 20%)
graph paper
paper towels

PROCEDURES

Using the beaker, pipet and balance determine the mass of 5.00 ml of the sugar solution. Do this for all of the standard sugar solutions. Next calculate the density of each solution.

Carefully plot the densities versus the sugar content (%) for each of the standard solutions. Determine a best-fit line for the points.

Determine the densities of the beverages and then use the graph to determine their sugar content.

NOTE: All carbonated beverages must be decarbonated before starting this activity.

ANALYSIS

Prepare a data table showing the stated and your calculated sugar content for each of the beverages you used. Include the table and your graph with your report.