Using Density to Determine the Sugar Content in Commercial Beverages (Revised)

Procedure

I. **Preparing Solutions of Known Sugar Content**
   1. In this experiment record masses to the nearest 0.01 g.
   2. Obtain a small bottle, and label it A. Record its mass.
   3. Pour 50 mL of distilled water into bottle A. Record its mass. This is 0 % sugar.
   4. Obtain a small bottle, and label it B. Record its mass.
   5. To prepare solution B, place about 2.5 g (± 0.1 g) of sugar in the bottle. Record the mass of the bottle and sugar.
   6. Using a graduated cylinder, transfer 48.0 mL of distilled water to the bottle. Record the mass of the solution.
   7. Cap the bottle and shake thoroughly to dissolve the sugar.
   8. To prepare solution C, repeat steps 3-6, using about 5.0 g (± 0.1 g) or sugar and 45.0 mL of distilled water.
   9. To prepare solution D, repeat steps 3-6, using about 7.5 g (± 0.1 g) of sugar and 42.0 mL of distilled water.

II. **Determining the Densities of the Sugar Solutions**
   9. Measure and record the mass of a clean, outside dry 50-mL beaker
   10. Rinse a 10-mL pipet with a small amount of the water from bottle A three times as previously instructed. Drain into a 150-mL beaker, labeled "Discard Solutions".
   11. Use the rinsed 10-mL pipet to transfer 10.00 mL of the liquid from A to the weighed 50-mL beaker. Measure and record the mass.
   12. Empty the contents of the beaker down the sink. Wash the beaker, then rinse with distilled water for reuse. Shake out as much water as you can and wipe the outside dry with paper towel.
   13. Repeat steps 9-12 two more times.
   14. Repeat steps 9-13, using solutions B, C, and D.

III. **Determining the Densities of Commercial Beverage Samples**
   15. Obtain three commercial beverage samples from your laboratory instructor. Record the names of the three samples.
   16. Repeat Steps 9-13 for each beverage sample.
   17. Pour the contents of the "Discard Solutions" down the sink and any leftover solutions and samples down the drain with large amounts of running water. Wash the glassware and return to the appropriate location.

Data Tables

I. **Solutions of Known Sugar Content**

Solution	Mass of bottle	Mass of bottle and sugar	Mass of bottle and solution	Mass of solution
A				
B				
C				
D				

II. **Densities of Sugar Solutions**

Solution	Trial	Mass of beaker	Mass of beaker and 10.00 mL of solution	Mass of 10.00 mL of solution	Average mass of 10.00 mL of solution
A	1				
	2				
	3				
B	1				
	2				
	3				
C	1				
	2				
	3				
D	1				
	2				
	3				

III. **Densities of Commercial Beverage Samples**

Name of Beverage	Trial	Mass of beaker	Mass of beaker and 10.00 mL of beverage	Mass of 10.00 mL of beverage	Average mass of 10.00 mL of beverage
	1				
	2				
	3				
	1				
	2				
	3				
	1				
	2				
	3				