Determining the Concentration of CO_2 in Seltzer

Objective: To determine Molarity of the CO_2 in seltzer,
and the Parts Per Million of CO_2 in seltzer, and finally,
the percent by mass of the CO_2 in seltzer.

Procedure:
READ THIS ALL FIRST then do what it says

- Get a CLEAN and dry a 100 mL beaker. Clean it if necessary, then dry it well.
- MASS the BEAKER WITH a STIRRING MAGNET
- POUR about 80 mL of seltzer CAREFULLY (lots of important bubbles) into the beaker
- IMMEDIATELY MASS the seltzer and beaker and stirring magnet
- Put beaker onto the stirring machine on low, slowly increase the spin speed, but DO NOT SPILL A DROP.
- DO NOT RUSH stir this up for 25 minutes
- Slow down, then turn off the stirring magnet before picking up the beaker.
- Mass the beaker at the end, which contains water now (carbon dioxide has exited)
- Remember that the density of water = 1.0 g/mL, so our mass of water in grams = mL of water too
- Wash everything with SOAP, then put this all upside down to drain please.

Step	DATA	Measurement
1	mass beaker + stirring magnet	
2	mass beaker + stirring magnet + seltzer at START	
3	Mass of the seltzer ONLY (subtract step 2 step 1)	
4	mass beaker + stirring magnet + WATER at END	
5	mass of water ONLY (subtract step 4 step 1)	
6	Volume of water (step 5 in grams = volume in mL)	
7	Mass of MISSING CO_2 (subtract step 2 step 4)	

1.7 x 10^1 Lab Questions: show all work.

1. Calculate the MOLARITY of CO_2 that your soda has. (show math and formulas)

2. Calculate the PPM of CO_2 in your soda. (show math and formulas)

3. Calculate the % by mass of CO_2 in your soda. (show math and formulas)

4. If he actual value for Molarity is 0.14 M. What is your percent error?

5. The actual value for PPM CO_2 in seltzer is 5800 PPM. What is your percent error?

6. How many grams of cobalt (II) nitrate are in 49.0 mL of a 3.25 M solution of $Co(NO_3)_{2(AQ)}$?

7. A 4,250. mL solution of contains 395.0 grams of sodium hypochlorite. This is the white powder that non-chemists call the "chlorine" that they use in their pools. What's this solution's molarity?

8. Would $NaClO_{(AQ)}$ conduct electricity? Explain why or why not?

9. If you have a 3.25 M $NaClO_{(AQ)}$ stock solution, explain how would you prepare 45.8 mL of a 0.975 Molar solution from it? Use a diagram, and calculations, to show how you would make this new solution.

10. How would you prepare 45.8 mL of a 0.975 Molar sodium hypochlorite solution from scratch?

11. If you have 4.65 M calcium chloride stock solution, how do you prepare a 135 mL of 1.25 M solution from it? Draw a diagram, label the ingredients.

12. Explain why you cannot prepare a 1.2 M $NH_4OH_{(AQ)}$ using a 0.95 M $NH_4OH_{(AQ)}$ stock solution.

13. Skip.

14. What is the molarity of a saturated solution at 30°C of potassium chloride? (table G might help you)

15. If your saturated solution of KI at 5°C is warmed up to 15°C, does the molarity of this solution change? Math is always okay, but it's not needed here.

16. When you have a stock solution on hand, which formula do you use to make another solution from it, the molarity formula or the dilution formula?

17. When you have no stock solution on hand, which formula do you use to make another solution from it, the molarity formula or the dilution formula?

18. A solution contains just 0.0033 grams of Na^{+1} cations per 500. mL. What is the PPM of Na^{+1} in this solution?

	This lab report requires	points
1	Cover page + introduction sentence	2
2	Filled in data table	4
calculations	17 problems	34
This lab is due on: _____		40