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 to 100 mL of seltzer CAREFULLY (lots of important bubbles) into the beaker on the scale.
- IMMEDIATELY record the total MASS of 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 (all 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	
4	mass beaker + stirring magnet + WATER at END	
5	mass of water ONLY	
6	Volume of water	
7	Mass of MISSING CO_2	

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

1. Calculate the MOLARITY of CO_2 in your seltzer. (You MUST show a formula and math)

2. Calculate the PPM of CO_2 in your seltzer. (You MUST show a formula and math)

3. Calculate the % by mass of CO_2 in your seltzer. (You MUST show a formula and math)

4. The actual Molarity of CO_2 in seltzer is 0.14 M. What is your percent error?

5. The actual value for PPM of 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 3.25 M $Co(NO_3)_{2(AQ)}$?

7. A 4,250. mL solution of sodium hypochlorite contains 395.0 grams of solute. This is the white powder that most non-chemists call "chlorine powder" that they use in their swimming pools. What is 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 250.0 mL of a 0.975 M $NaClO_{(AQ)}$ from it? You MUST use a formula, do the math, and then, DRAW a diagram to show how to mix this solution.

10. How would you prepare 250.0 mL of a 0.975 M 0.975 M $NaClO_{(AQ)}$ from scratch? You MUST use a formula, do the math, and then, DRAW a diagram to show how to mix this solution.

11. If you have 4.00 M calcium chloride stock solution, how do you prepare a 125.0 mL of 2.25 M solution from it? You MUST use a formula, do the math, and then, DRAW a diagram to show how to mix this solution.

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 of potassium chloride at 30°C ?

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 necessary here.

16. If you have a 100 mL saturated solution of $NH_{3(AQ)}$ at 10°C and warm it up to 90°C, does the Molarity of this solution change? Math is always okay, but it's not necessary here either.

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