

Chem Lab: Molar Concentration of HCl!

Name: _____

Partners:

Purpose:

To determine the molarity of a solution of hydrochloric acid.

You will react a known volume of HCl solution with calcium carbonate chips, and use the initial and final masses of the calcium carbonate to calculate the moles of HCl that must have reacted, which will allow you to calculate the molarity of the acid.

Equation: Write a balanced chemical equation (with subscripts) to show the reaction between HCl and solid calcium carbonate.

Procedure:

1. Make sure that your 100 mL beaker is clean and dry. Write in pencil (carbon in the form of graphite), darkly, on a piece of masking tape. Place tape on beaker.
2. Obtain the mass of the beaker with masking tape and carbon atoms and record.
3. Add 4-5 marble chips (calcium carbonate) to your beaker. Weigh the beaker and chips together; record.
4. Measure the following amount of HCl solution in your grad cylinder.
 - use 45.0 mL acid left side
 - use 40.0 mL acid middle
 - use 35.0 mL acid right side
5. Record the volume of acid used in your data table.
6. Pour the acid into the beaker with the marble chips. Record observations:
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7. Rinse grad cylinder with tap water and put away. Put your beaker and contents on the shelf of the bench near the inside wall.
8. (The next day) Observe the contents of the beaker:
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9. Decant the clear solution from your beaker into the sink (Don't dump out the solid!)
10. Add distilled water to the chips in the beaker. Swirl and let the solid settle. Decant again. (Don't dump out the solid!)
11. Repeat step 10.
12. Make sure that you labeled your beaker. Take the beaker to Ms. Purcell/Ms. Wardrop to dry.
13. (The next class...) Weigh your beaker and remaining marble chips; record.
14. Dump the chips in the trash, rinse beaker with tap water, and put away beaker.

Calculations and Questions:

1. On day two, how did you know, from your observations, that the reaction was essentially complete?
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2. Calculate the mass of calcium carbonate that reacted.
3. Use stoichiometry to determine the number of moles of HCl that must have reacted with that mass of calcium carbonate.

4. Calculate the molarity of the HCl solution.

5. Which reactant was the limiting reactant? _____

Which reactant was the excess reactant? _____

How much of the excess reactant was left over? _____