

LAB # 4

Rate of Production of a Gas

Calculations:

1. Graph the data with time on the x-axis and volume of gas on the y-axis. Draw a best-fit curve.
2. Choose a point on your graph where the reaction appears to be slowing down. Draw a tangent to that point. Make the tangent very long! Now determine the slope of your tangent. Show all of your work on the graph. What was the instantaneous rate of the reaction at that point in the reaction? REMEMBER UNITS!

Questions:

1. What does the shape of your graph tell you about the rate of production of gas as the reaction proceeds?
2. Your graph shows a plateau at the beginning of the graph. The graph of a typical reaction does not have a plateau at the beginning. Suggest two reasons why this first plateau exists.
3. What does the plateau at the end of the graph indicate?
4.
 - a) Write the balanced equation for the reaction of magnesium with hydrochloric acid.
 - b) Instead of measuring volume of the gas produced, what other measurement could have been taken in this lab to determine the rate?
 - c) Consider the instantaneous rate of the reaction that you calculated. This is the rate of appearance of H_2 . At the same time at what rate was the hydrochloric acid disappearing? HINT: Look at your balanced equation.
5. Read page 370-371 in your textbook.
 - a) Describe three ways that the rate of the reaction in this lab could be increased. Be very specific!! (NOTE: Adding a catalyst is not a reasonable way to increase the rate in this lab)
 - b) How would increasing the rate of the reaction change the shape of your graph?
 - c) The reaction of magnesium with an acid is exothermic. In light of your answer to part (a), how might this have affected your results? Explain.