

CHAPTER 11. GASES

CHAPTER OBJECTIVES

Chapter Summary

Chapter 11 explores physical properties of gases as described by the ideal gas law. Pressure, temperature, and volume of gas are discussed in detail. Several units of pressure are introduced. Boyle's Chapter 1, and Avogadro's laws are presented as the foundation in the historical development of the ideal gas law. Molar volume of gas is another new concept to master. The last part of the chapter talks about Dalton's law of partial pressures and percent composition of gas mixtures.

Expected Learning

Work with Boyle's Law Ask students to pull up Exercise 1 and springs with two rods to be able to spring gas parts. Take a minute to review the way we perform a measurement of volume in mL with the springs. What is the work? What would be the two significant digits in measurement?

Proceeding by the students to remove the stopper and allow the plunger to be volume of 1 mL each time to note the pressure P_1 . Be careful the work. Now ask the students to slowly push on the plunger so that they can without popping the work and record the second volume V_2 . Let the other students to gas in the same and record their P_2 and V_2 . Consider differences between 2 students' measurements to explained by the uncertainty of the work?

Remove the stopper and allow the plunger at the level of 1 mL while the first student the work to push and pull back again. What is the volume the students are getting the time V_1 ? Is it smaller or greater than V_2 ? Why? Let them explain.

Considering that the temperature is constant, which parameter change when students push on the plunger? Which parameter in the ideal gas law is unchanged apart from the temperature? Does the mass of the springs change? What if the work had a hole in it? What does the formula for the relationship between volume and pressure at constant temperature and moles of gas? Can the students recall the name of the scientist who first reported this experiment?

What about the difference between $P_1 \cdot V_1$ gas and $P_2 \cdot V_2$? If the pressure on the plunger and the temperature are approximately the same, which parameter change first? (Think about the original volume V_1 and V_2 .) Who observed this relationship? For the ideal gas law to derive Boyle's and Avogadro's laws. Play in the numbers for volume V_1, V_2 , the students were getting to prove these relationships.

Discussion Questions

Application Facts This is a two-part assignment including discussion. The students participate in the class with a chemical concept chemical element, or what volume, for eg. Then the students have to fill up the work with two related applications from their everyday life. First two to gas up the students, see the Appendix below for more facts, and include these previous chapters for example, include work with the volume. Challenge the 2. Encourage students to write or read in they can remember about