Boyle's Law Encyclopedia Article

Boyle's Law

The following sections of this BookRags Literature Study Guide is offprint from Gale's For Students Series: Presenting Analysis, Context, and Criticism on Commonly Studied Works: Introduction, Author Biography, Plot Summary, Characters, Themes, Style, Historical Context, Critical Overview, Criticism and Critical Essays, Media Adaptations, Topics for Further Study, Compare & Contrast, What Do I Read Next?, For Further Study, and Sources.

(c)1998-2002; (c)2002 by Gale. Gale is an imprint of The Gale Group, Inc., a division of Thomson Learning, Inc. Gale and Design and Thomson Learning are trademarks used herein under license.

The following sections, if they exist, are offprint from Beacham's Encyclopedia of Popular Fiction: "Social Concerns", "Thematic Overview", "Techniques", "Literary Precedents", "Key Questions", "Related Titles", "Adaptations", "Related Web Sites". (c)1994-2005, by Walton Beacham.

The following sections, if they exist, are offprint from Beacham's Guide to Literature for Young Adults: "About the Author", "Overview", "Setting", "Literary Qualities", "Social Sensitivity", "Topics for Discussion", "Ideas for Reports and Papers". (c)1994-2005, by Walton Beacham.

All other sections in this Literature Study Guide are owned and copyrighted by BookRags, Inc.

Contents

Boyle's Law Encyclopedia Article.....1

Contents.....2

Boyle's Law.....3

Boyle's Law

Boyle's law is an expression states that the volume of a given amount of a gas varies inversely with pressure. This principle is important because chemistry often involves the study of gases which are hard to measure because they expand to fill whatever container they are in. The value of Boyle's law lies in its ability to calculate a gas's volume at a standard pressure without actually having to measure the volume at that pressure.

This well known law of nature is named after Robert Boyle, the British chemist who first published his ideas on this concept in 1662. (French chemist Edme Mariotte (1620-1684) reported similar findings in 1679, and the French sometimes call the formula Mariotte's law.) To determine gas pressure, Boyle used a long, handmade glass tube bent in the shape of the letter "J" and filled it with mercury; with a paper scale pasted on the tube. As Boyle introduced gas into one end of the tube he measured how much mercury was displaced in the other end and thus determined the pressure and volume of the gas with which he was experimenting. This technique gave results were remarkably accurate. He found that when a gas is compressed, or pressurized, its volume decreases as its pressure increases, provided that its temperature remains the same. If the pressure on a given quantity of gas is doubled, the gas's volume is cut in half; if pressure is tripled, volume is reduced to one-third. This mathematical relationship is called *inversely proportional*, and multiplying the pressure by volume yields a constant number.

A companion to Boyle's law, known as Gay-Lussac's law or Charles' law, allows chemists to calculate gas volumes at standard temperature in a similar way, but this temperature law was not discovered until 1802. Although Boyle worked with air rather than a specific gas, Boyle's law applies to most ordinary gases. However, under extreme conditions such as high pressures or low temperatures, as French chemist Henri Regnault (1810-1878) later explained, gases deviate from the ideal behavior explained in Boyle's law. Johannes Diderik van der Waals eventually developed a mathematical equation for calculating gas pressure and volume more accurately.