Heat of Vaporization Encyclopedia Article

Heat of Vaporization

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

Heat of Vaporization Encyclopedia Article.....1

Contents.....2

Heat of Vaporization.....3

Heat of Vaporization

When a substance changes phase from liquid to gas, **heat energy** is required. The heat energy that is used to transform a liquid into a gas, or vapor, is called the heat of vaporization. As **thermal energy** is applied to a volume of a given liquid at a constant given **pressure**, the **temperature** of the liquid rises. With the continued application of heat, the temperature steadily increases until, at some characteristic point (called the **boiling** point) the liquid begins to shift from liquid to gas. While boiling, the temperature does change even though heat energy is being added. The heat, instead of causing a rise in temperature, is absorbed by the molecules as they are liberated into gaseous form. The heat that is required in this process is the heat of vaporization for the liquid. However, the amount of heat required is always dependent on the external pressure exerted on the liquid and the actual composition of the liquid itself.

Because heat energy is consumed without a concomitant increase in temperature, it is also known as **latent heat** of transformation. Heat of vaporization for substances is dependent on a number of different factors, including pressure and external temperature. For example, the human body exploits the vaporization of water to cool itself through sweat--and it does so at temperatures far below water's boiling point. Substances like rubbing alcohol have vaporization points that are even lower than their boiling points. Heat of vaporization is often expressed as the amount of heat (in Joules) that is required to change 1 gram of liquid into gas. For example, the heat of vaporization of water is 2,260 Joules of heat per gram. At sea level, this translates into about 540 calories per gram of water vapor.

This relatively high value is an important characteristic of water because it allows water to absorb large amounts of heat as it changes phase. This quality explains how perspiration cools body temperature as it evaporates from skin, and why burn injuries from steam are more serious than from water at the same (boiling) temperature.