Lenz's Law Encyclopedia Article

Lenz'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

Lenz's Law Encyclopedia Article.....1

Contents.....2

Lenz's Law.....3

Lenz's Law

In 1834, Russian physicist **Heinrich Lenz** discovered the directional relationships between induced magnetic fields, **voltage**, and current when a conductor is passed within the lines of a magnetic field. Lenz's law states:

"An induced electromotive force generates a current that induces a counter magnetic field that opposes the magnetic field generating the current."

Physically, Lenz's law merely tells us what direction an induced current flows in a conductor given a change in the magnetic field through the conductor. The induced current circulates in a sense such that the magnetic field it produces opposes the change in the field that induced the current to begin with. This opposition can be compared to the opposing **force** two magnets experience when pushed together with like poles facing each other. Mathematically, Lenz's law is used to keep track of the negative sign in Faraday's Law which gives the relationship between a changing magnetic field and the voltage produced by the change in the field.

Of significance to Lenz's law is its relationship to the **conservation of energy**. Lenz's Law states the fact that **energy** is conserved for the case of induced currents and the magnetic fields they produce. This can be seen by assuming that if the induced current circulated in a sense that reinforced the change in magnetic field instead of opposing it, this would lead to a greater induced current, which would lead to greater reinforcing of the field. This cycle would continue ad infinitum, thus breaking the law of conservation of energy.