Polyurethane Encyclopedia Article

Polyurethane

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

Polyurethane Encyclopedia Article.....1

Contents.....2

Polyurethane.....3

Polyurethane

Polyurethanes are a class of linear polymers characterized by a molecular backbone that contains carbamate groups (-NHCOO). These groups are also called urethane groups and are the result of a chemical reaction between a diisocyanate with a polyol. First investigated in the late 1930s, polyurethanes have become important materials used for a wide variety of applications from building insulation to athletic apparel.

Research in the **chemistry** of polyurethane materials was initiated by the German chemist, Friedrich Bayer in 1937. This early work was based on toluene diisocyanate reacted with dihydric alcohols. One of the first crystalline polyurethane fibers was Perlon U. In 1953, commercial production of a flexible polyurethane foam was begun in the United States. This material was used as foam insulation. In 1956, more flexible, less expensive foams were made. In the late 1950s moldable polyurethanes were produced. Also, spandex fibers, polyurethane coatings, and thermoplastic **elastomers** were introduced.

Polyurethanes have many characteristics that make them useful for a variety of applications. They are produced in four different forms including fibers, elastomers, coatings, and cross-linked foams. Polyurethane fibers are lightweight and have a high degree of stretchability which makes them good for applications like swimsuits and other athletic apparel. The elastomers can be stretched but will eventually return to their original shape. They are resistant to abrasion and grease, and have good hardness. This makes them useful as base materials for small wheels. Polyurethane coatings demonstrate a resistance to solvent degradation and have good impact resistance. These coatings are used on surfaces where these characteristics are important such as bowling alleys and dance floors. Foam polyurethanes have high-impact strength. They are used for the production of pillows and cushions.