

# Characterization of Polymers Using TGA

W.J. Sichina, Marketing Manager

## Introduction

Thermogravimetric analysis (TGA) is one of the members of the family of thermal analysis techniques used to characterize a wide variety of materials. TGA provides complementary and supplementary characterization information to the most commonly used thermal technique, DSC.

TGA measures the amount and rate (velocity) of change in the mass of a sample as a function of temperature or time in a controlled atmosphere. The measurements are used primarily to determine the thermal and/or oxidative stabilities of materials as well as their compositional properties. The technique can analyze materials that exhibit either mass loss or gain due to decomposition, oxidation or loss of volatiles (such as moisture). It is especially useful for the study of polymeric materials, including thermoplastics, thermosets, elastomers, composites, films, fibers, coatings and paints.

TGA measurements provide valuable information that can be used to select materials for certain end-use applications, predict product performance and improve product quality. The technique is particularly useful for the following types of measurements:

- Compositional analysis of multi-component materials or blends
- Thermal stabilities
- Oxidative stabilities
- Estimation of product lifetimes
- Decomposition kinetics
- Effects of reactive atmospheres on materials
- Filler content of materials
- Moisture and volatiles content

PerkinElmer offers a variety of high performance TGA instruments encompassing a wide range of application needs and operational requirements. All of the TGA instruments feature an optional, state-of-the-art autosampler for reliable, unattended operation.

The extended capabilities of the PerkinElmer TGA, as a valuable tool for polymeric characterization and quality assurance are demonstrated by these applications.

## Thermal Stabilities and Moisture Content

Figure 1 shows the TGA results generated on nylon 6,6 toothbrush bristles. The plot shows the percent mass as a function of sample temperature for the nylon 6,6 bristles under a nitrogen purge. Approximately 10 mg of sample was heated at a rate of 30 C/min with the PerkinElmer TGA.

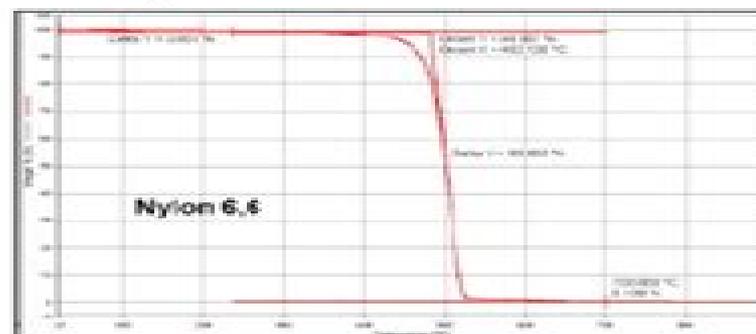


Figure 1. TGA results obtained for nylon 6,6 bristles showing thermal degradation.

# Characterization Analysis Of Polymers

**Ian Pickup**



## **Characterization Analysis Of Polymers:**

## **Characterization Analysis Of Polymers** Book Review: Unveiling the Magic of Language

In an electronic era where connections and knowledge reign supreme, the enchanting power of language has are more apparent than ever. Its capability to stir emotions, provoke thought, and instigate transformation is really remarkable. This extraordinary book, aptly titled "**Characterization Analysis Of Polymers**," published by a very acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound affect our existence. Throughout this critique, we will delve to the book is central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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### **Table of Contents Characterization Analysis Of Polymers**

1. Understanding the eBook Characterization Analysis Of Polymers
  - The Rise of Digital Reading Characterization Analysis Of Polymers
  - Advantages of eBooks Over Traditional Books
2. Identifying Characterization Analysis Of Polymers
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an Characterization Analysis Of Polymers
  - User-Friendly Interface
4. Exploring eBook Recommendations from Characterization Analysis Of Polymers
  - Personalized Recommendations
  - Characterization Analysis Of Polymers User Reviews and Ratings

- Characterization Analysis Of Polymers and Bestseller Lists
- 5. Accessing Characterization Analysis Of Polymers Free and Paid eBooks
  - Characterization Analysis Of Polymers Public Domain eBooks
  - Characterization Analysis Of Polymers eBook Subscription Services
  - Characterization Analysis Of Polymers Budget-Friendly Options
- 6. Navigating Characterization Analysis Of Polymers eBook Formats
  - ePub, PDF, MOBI, and More
  - Characterization Analysis Of Polymers Compatibility with Devices
  - Characterization Analysis Of Polymers Enhanced eBook Features
- 7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of Characterization Analysis Of Polymers
  - Highlighting and Note-Taking Characterization Analysis Of Polymers
  - Interactive Elements Characterization Analysis Of Polymers
- 8. Staying Engaged with Characterization Analysis Of Polymers
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers Characterization Analysis Of Polymers
- 9. Balancing eBooks and Physical Books Characterization Analysis Of Polymers
  - Benefits of a Digital Library
  - Creating a Diverse Reading Collection Characterization Analysis Of Polymers
- 10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
- 11. Cultivating a Reading Routine Characterization Analysis Of Polymers
  - Setting Reading Goals Characterization Analysis Of Polymers
  - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Characterization Analysis Of Polymers
  - Fact-Checking eBook Content of Characterization Analysis Of Polymers
  - Distinguishing Credible Sources

13. Promoting Lifelong Learning
  - Utilizing eBooks for Skill Development
  - Exploring Educational eBooks
14. Embracing eBook Trends
  - Integration of Multimedia Elements
  - Interactive and Gamified eBooks

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