

Thermogravimetric Analysis

PerkinElmer, TGA 4000



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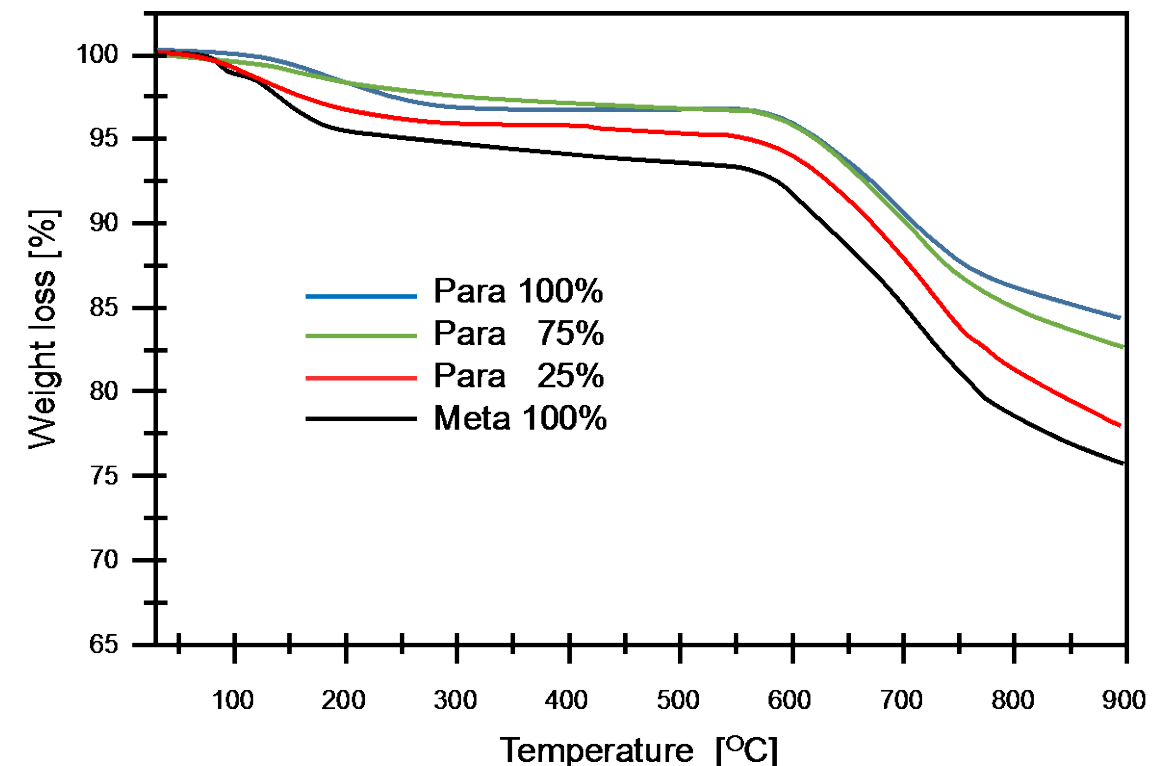
Introduction

Thermogravimetric Analysis (TGA) is a technique in which the mass of a substance is monitored as a function of temperature or time as the sample specimen is subjected to a controlled temperature program in a controlled atmosphere.



Principle

A TGA consists of a sample pan that is supported by a precision balance. That pan resides in a furnace and is heated or cooled during the experiment. The mass of the sample is monitored during the experiment. A sample purge gas controls the sample environment. This gas may be inert or a reactive gas that flows over the sample and exits through an exhaust. The weight of the sample is plotted against temperature or time to illustrate thermal transitions in the material.



TGA curves of PBI polymers with different para content.

Applications

The most common TGA analyses are:

- determining the degree of hydration
- quantification of level of residual solvent or moisture
- determining the thermal stability
- determining oxidative stability
- decomposition kinetics
- copolymer or polymer blend characterization