

Thermal Behavior of Polymeric and Other Advanced Materials

Małgorzata Maciejewska * and Magdalena Rogulska 

Department of Polymer Chemistry, Institute of Chemical Sciences, Faculty of Chemistry, Maria Curie-Skłodowska University in Lublin, Gliniana 33, 20-614 Lublin, Poland; mrogulska@umcs.lublin.pl

* Correspondence: mmacieje@umcs.pl

Thermal Behavior of Polymeric and Other Advanced Materials is a recently open Special Issue in *Materials*, which aims to publish original articles, short communications, reviews, and mini-reviews covering the most recent progress in multiple thermal characterizations of diverse materials and provide a platform for scientists from various areas to present their research.

Thermal behavior can be regarded as a material's response to being heated, cooled, or, sometimes, held isothermally. The determination of the relationship between temperature and specific physical properties of materials, especially thermal ones, is particularly important from the point of view of their usage and processing. Various thermal analysis techniques, such as thermogravimetry (TG), differential thermal analysis (DTA), and differential scanning calorimetry (DSC), can be used to achieve this goal. As is well known, advanced materials are often expected to withstand extremely high or extremely low temperatures. Application of the DTA and DSC allows one to determine temperatures and enthalpies of phase transformations as well as heat capacities in a temperature range from -150 to 1500 °C. In turn, the TG provides information on the thermal stability of materials and their decomposition process. Thermal techniques are also of great importance because they enable the evaluation of chemical purity of many compounds, precursors, and ultimate products. Furthermore, detailed investigation of the thermal behavior of divergent materials creates a possibility to improve their properties and achieve more effective ones. A deep insight into thermal properties as well as the recognition of changes in these properties during exploitation results in the expansion of the area of their application.

Additionally, thermal properties are of paramount importance in the environmental aspects of the investigation, including the combustion and recycling of polymeric materials, the thermal use of polymer waste with energy recovery, photovoltaic and thermal insulation materials, and many other significant issues.

The research interest in the Thermal Behavior of Polymeric and Other Advanced Materials includes, but is not limited to, the following: thermal stability of polymers and other advanced materials, thermogravimetry (TG) and evolved gas analysis, differential scanning calorimetry (DSC), differential thermal analysis (DTA), dynamic mechanical thermal analysis (DMTA), decomposition of polymers and composites, thermal energy storage, thermal insulation materials, and thermal recycling of polymeric materials.

Conflicts of Interest: The authors declare no conflict of interest.



Citation: Maciejewska, M.; Rogulska, M. Thermal Behavior of Polymeric and Other Advanced Materials. *Materials* **2023**, *16*, 2875. <https://doi.org/10.3390/ma16072875>

Received: 3 April 2023

Accepted: 3 April 2023

Published: 4 April 2023



Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Short Biography of Authors

Dr. hab. Małgorzata Maciejewska is a specialist in the field of polymer chemistry. She received both a master's degree in chemistry in 1997 and a doctor's degree in polymer chemistry in 2002 from the Maria Curie-Skłodowska University in Lublin, Poland. From 2002 to 2015, she continued research in this field and obtained a habilitation degree for a thesis entitled "Permanently porous polymer materials—preparation, characterization, selected directions of applications". Her research areas involve: polymer synthesis and characterization, porous polymers, functionalization of polymer surface, modification of natural polymers, and thermal analysis of natural and synthetic polymers. Special attention is devoted to thermogravimetry coupled with FTIR spectroscopy and differential scanning calorimetry. She is the author or co-author of over 60 scientific articles published in journals from the Philadelphia list and other renowned specialist journals as well as many presentations at international conferences. Dr hab. Maciejewska is also a reviewer in international journals and a member of scientific societies: The Polish Society of Calorimetry and Thermal Analysis and The European Chemical Society. She collaborates with many scientists from Poland and other research centers. Dr hab. Maciejewska is open to all kinds of cooperation.

Dr. hab. Magdalena Rogulska is an associate professor in the Department of Polymer Chemistry at the Faculty of Chemistry of Maria Curie-Skłodowska University (MCSU) in Lublin, Poland. She has been associated with the UMCS since 1997, when she obtained a master's degree in chemistry and then a DSc and habilitation. Her research is concerned with the synthesis and study of the properties of new polymeric materials, mainly sulfur-containing thermoplastic polyurethanes, as well as the synthesis and characterization of different low-molar-mass organic compounds used as monomers in obtaining polymers. Recently, she has been devoting her efforts mainly to thermal analysis by means of thermogravimetry coupled online with FTIR spectroscopy and differential scanning calorimetry. She is a member of the Polish Society of Calorimetry and Thermal Analysis. To date, she has published over 60 peer-reviewed papers in journals from the Philadelphia list and other renowned specialist registers. Her Hirsch index is 13, with a total number of citations of over 560. She has reviewed numerous articles at the invitation of editors of reputable international journals.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.