Thermal properties of nanotitania - modified polypropylene fibers

Alicja Nejman, Małgorzata Cieślak

Textile Research Institute, Scientific Department of Unconventional Technologies and Textiles, 5/15 Brzezinska Str., 92-103 Lodz, Poland

anejman@iw.lodz.pl

Abstract

Nanotechnology is an interdisciplinary technology which enables the production of functional and innovative textile materials with a new features without compromising the basic properties of textile product. Oxidising and reducing properties of titanium dioxide (TiO_2) and the ability to receive TiO_2 in the nanometric form, cause the dynamic development of its use as photocatalytic modifier [1,2]. Titanium dioxide (TiO_2), thanks to its unique properties is used in many areas [3], including the textile industry, e.g. PP fiber matting. Textile materials modified with TiO_2 and their application potential are realistic chance of producing a new generation of products for technical applications. This requires the selection of a suitable product, textile structure and the effective conditions of nanomodification. Thanks to the nanotechnology development it is possible to modify fibers surfaces with nano-TiO_2 in order to obtain functional photocatalytic fibers for purification systems, e.g. decompositon of VOCs pollutants [4,5]. Functional oriented design of fibers can change other basic properties of the modified fibers, e.g. thermal properties. The aim of presented work was to assess the impact of TiO_2 modification on thermal properties of polypropylene fibers. The research of unmodified (PP) and modified polypropylene fibers (PP/T) were conducted. The technique of differential scanning calorimetry (DSC) with the use of the thermal analyzer DSC 204 F1 Phoenix and thermogravimetric analysis (TGA) with the use of the therobalance TG 209 F1 Libra (Netzsch, Germany) were applied.

References

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Acknowledgements

The study has been carried out within the Ministry of Science and Higher Education, Poland [grant number N N508 440736] and the part of work was supported by the Key Project – POIG.01.03.01-00-004/08 Functional nano- and micro textile materials - NANOMITEX co-financed by the European Union with the financial resources of the European Regional Development Fund and the National Centre for Research and Development within the framework of the Innovative Economy Operational Programme, 2007-2013, Priority 1. Research and development of modern technologies, Activity 1.3. Supporting R&D projects for enterprises undertaken by science establishments, Subactivity 1.3.1. Development projects.