

Accepted Manuscript

Title: "Improvement in the energy dissipation capacity of polypropylene composites through a surface modification of titanium dioxide particles with a dicarboxylic acid"

Authors: J.A. Gonzalez-Calderon, R. López-Esparza, R. Saldivar-Guerrero, A. Almendarez-Camarillo



PII: S0040-6031(18)30109-6
DOI: <https://doi.org/10.1016/j.tca.2018.04.008>
Reference: TCA 77978

To appear in: *Thermochimica Acta*

Received date: 30-10-2017
Revised date: 11-3-2018
Accepted date: 12-4-2018

Please cite this article as: J.A.Gonzalez-Calderon, R.López-Esparza, R.Saldivar-Guerrero, A.Almendarez-Camarillo, "Improvement in the energy dissipation capacity of polypropylene composites through a surface modification of titanium dioxide particles with a dicarboxylic acid", *Thermochimica Acta* <https://doi.org/10.1016/j.tca.2018.04.008>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

"Improvement in the energy dissipation capacity of polypropylene composites through a surface modification of titanium dioxide particles with a dicarboxylic acid."

J.A. Gonzalez-Calderon^{1,*} amir.gonzalez@iqcelaya.itc.mx , R. López-Esparza², R. Saldivar-Guerrero³, A. Almendarez-Camarillo^{4,*} armando@iqcelaya.itc.mx

¹Departamento de Ingeniería Industrial, Posgrado en Ciencias en Ingeniería Bioquímica. Instituto Tecnológico de Celaya, Av. Tecnológico y Antonio García Cubas s/n. Celaya, Guanajuato 38010, Mexico

²Posgrado en Nanotecnología. Departamento de Física, Universidad de Sonora, Apdo. Postal 1626, 83000 Hermosillo, Sonora, Mexico.

³ Centro de Investigación en Química Aplicada, Blvd. Enrique Reyna Hermosillo 140, Saltillo, Coahuila 25294, México

⁴ Departamento de Ingeniería Química, Instituto Tecnológico de Celaya, Av. Tecnológico y Antonio García Cubas s/n. Celaya, Guanajuato 38010, Mexico.

***Corresponding authors.: Tel.: +52 4616117575; fax: +52 4616117744.; (J.A. Gonzalez-Calderon); (A. Almendarez-Camarillo)**

Highlights

- Chemical linkage of pimelic acid on the TiO₂ surface by a free solvent reaction
- Linkage of pimelic acid on TiO₂ surface is not affected by photo-degradation
- Modification of TiO₂ improves the energy dissipation capacity of iPP composites

Abstract:

In this work, we modified commercial TiO₂ nanoparticles using pimelic acid (PA) as an agent to improve interaction of titanium dioxide (TiO₂) into an isotactic polypropylene (iPP) matrix. The chemical bond of PA at the TiO₂ surface, allows a thermal and UV stabilization of PA molecules avoiding its decomposition in a process involving high temperature. As a consequence of an appropriate TiO₂ integration into iPP, the results of the dynamical-mechanical analysis reveal that the iPP filled with modified particles (c-TiO₂) dissipate around two times more energy than those with the non-modified particles (n-TiO₂). A multi-frequency analysis of these composites also allowed us to estimate the apparent activation energy required to carry out the vitreous

Download English Version:

<https://daneshyari.com/en/article/7061935>

Download Persian Version:

<https://daneshyari.com/article/7061935>

[Daneshyari.com](https://daneshyari.com)