Insight Medical Publishing

Nano Research & Applications

ISSN 2471-9838

2020

Vol.6 No.3

Thermomechanical Tests Applied To The Characterization Of Green Polyurethane Foams

D. Granados[1*], M. Bagni[2], M. Reboredo[3]

[1] Institute of Chemical Engineering (National University of San Juan, Argentina)
[2] Institute of Chemical Engineering (National University of San Juan, Argentina)
[3] Institute of Research in Materials Science and Technology, CONICET, NationalUniversity of Mar del Plata, Argentina)

Abstract

In recent years, there has been an increasing demand for products of renewable origin with the aim of providing solutions to environmental problems. Biobased polymers are a innovative technology to replace traditional materials with ecofriendly substances. The new polymers are expected to exhibit similar performance to those of petrochemical origin. In this work, thermo-rigid polyurethane foams derived from olive oil industry sub-products, were evaluated by thermomechanical tests, to complement previous studies of chemical characterization. Biopolymers were synthesized by reacting 4,4'-diphenylmethyldiisocyanate with polyols derived from three low-quality oil fractions not suitable for human consumption: olive-pomace oil, lamp oil, and clear oil lees. Polyols were obtained from these oil fractions through a modification process that involves steps of epoxidation, hydrolysis and transesterification. In addition, samples of polyurethane foams using a commercial polyol of non-renewable origin, Jeffol G30-650, were made for comparative purposes. Dynamic mechanical analysis (DMA) and differential scanning calorimetry (DSC) tests were performed. The glass transition temperature values found for each sample were estimated at the beginning of the transition. The glass transition temperature values obtained by both thermal characterization methods and the analysis of the storage modulus profiles as a function of temperature, together with the results obtained in previous characterizations, allow to affirm that the synthesized polyurethanes have thermo- mechanical and chemical characteristics that make them suitable for low to moderate demand applications.

Biography:

DOLLY GRANADOS graduated in Chemical Engineering in National University of San Juan and received her PhD in Materials Science in National University of Mar del Plata, Argentina. It carries out her research activities in the Materials Area of Chemical Engineering Institute, aimed at the development of adsorbents materials and composite, polymeric and ceramic ecomaterials, obtained from regional agro-industrial waste. She is member of the Academic Committee in the Posgraduate Program in Chemical Engineering - Clean Processes, directing doctoral theses. She is also Professor of Biomaterials (medicine applied materials) in the Department of Bioengineering.

Webinar on Materials Science & Engineering ;**September 28-29, 2020.**