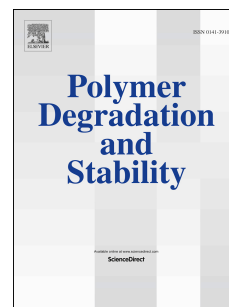


Accepted Manuscript

Hydrolytic stability of polycarbonate-based polyurethane elastomers tested in physiologically simulated conditions

Magdalena Serkis, Milena Špírková, Rafał Poręba, Jiří Hodan, Jana Kredatusová, Dana Kubies



PII: S0141-3910(15)00167-6

DOI: [10.1016/j.polymdegradstab.2015.04.030](https://doi.org/10.1016/j.polymdegradstab.2015.04.030)

Reference: PDST 7644

To appear in: *Polymer Degradation and Stability*

Received Date: 26 February 2015

Revised Date: 21 April 2015

Accepted Date: 28 April 2015

Please cite this article as: Serkis M, Špírková M, Poręba R, Hodan J, Kredatusová J, Kubies D, Hydrolytic stability of polycarbonate-based polyurethane elastomers tested in physiologically simulated conditions, *Polymer Degradation and Stability* (2015), doi: 10.1016/j.polymdegradstab.2015.04.030.

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.

Hydrolytic stability of polycarbonate-based polyurethane elastomers tested in physiologically simulated conditions

Magdalena Serkis, Milena Špírková*, Rafał Poręba, Jiří Hodan, Jana Kredatusová,
Dana Kubies

*Institute of Macromolecular Chemistry AS CR, v.v.i., Heyrovského nam. 2,
162 06 Prague 6, Czech Republic (e-mail: spirkova@imc.cas.cz)*

*Corresponding author: spirkova@imc.cas.cz

ABSTRACT: The hydrolytic stability of all-aliphatic polyurethane (PU) films made from polycarbonate-based aliphatic macrodiols (MD), diisocyanate-1,6-hexane and butane-1,4-diol (BD) were tested at 37 °C in phosphate buffer for a period up to 12 months. Two macrodiols, differing in composition and chain regularity and two MD-to-BD ratios were chosen for PU synthesis. The isocyanate-to-total hydroxyl ratio was kept constant and equal to 1.05. The functional properties of the original polyurethane films and films being immersed for 1, 3, 6 and 12 months in model physiological environment (37 °C at pH = 7.4) were studied on segmental up to macroscopic levels. The combination of SEM, AFM, FTIR, DSC, tensile and swelling analyses were used. It was found that prepared PU films are very good elastomeric materials with outstanding mechanical and suitable thermal properties keeping these properties practically unchanged for a period of up to 12 months. They can be practically used for example as strong and durable topcoats.

Keywords: polyurethane, elastomer, hydrolytic stability, surface analysis, mechanical properties, thermal properties

Download English Version:

<https://daneshyari.com/en/article/5201434>

Download Persian Version:

<https://daneshyari.com/article/5201434>

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