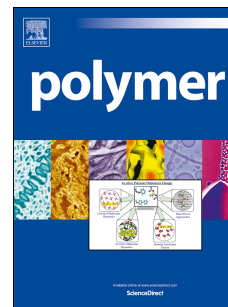


Accepted Manuscript

Modulation of the effective viscosity of polymer films by ultraviolet ozone treatment

Xuanji Yu, Anjeza Beharaj, Mark W. Grinstaff, Ophelia K.C. Tsui



PII: S0032-3861(17)30072-1

DOI: [10.1016/j.polymer.2017.01.046](https://doi.org/10.1016/j.polymer.2017.01.046)

Reference: JPOL 19363

To appear in: *Polymer*

Received Date: 8 December 2016

Revised Date: 20 January 2017

Accepted Date: 21 January 2017

Please cite this article as: Yu X, Beharaj A, Grinstaff MW, Tsui OKC, Modulation of the effective viscosity of polymer films by ultraviolet ozone treatment, *Polymer* (2017), doi: 10.1016/j.polymer.2017.01.046.

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.

Modulation of the Effective Viscosity of Polymer Films by Ultraviolet Ozone Treatment

Xuanji Yu,^{1,2} Anjeza Beharaj,³ Mark W. Grinstaff,³ Ophelia K. C. Tsui^{1,2,4*}

¹ Department of Physics, Boston University, Boston, MA 02215.

² Division of Materials Science and Engineering, Boston University, Boston, MA 02215.

³ Department of Chemistry, Boston University, Boston, MA 02215.

⁴ Department of Physics, Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, HONG KONG.

*Correspondence to: okctsui@bu.edu.

Keywords: Polymer thin films, Effective Viscosity, Nanoconfinement, Surface modification

Abstract: Nanoconfinement of a polymer film affords a reduction of the glass transition temperature (T_g) and effective viscosity (η_{eff}). Early on, Prof. Tisato Kajiyama pioneered the idea of enhanced polymer mobility at the free surface. This concept is now well established, and accounts for the T_g and η_{eff} reductions of thin polymer films. To pay tribute to Prof. Kajiyama's seminal contribution, it is fitting to report in this special issue the use of ultraviolet ozone (UVO) to chemically modify the surface of polymer films and thereby alter their dynamical properties for the first time. Specifically, we show that with a brief exposure time of only 1.0 second under typical UVO treatment conditions, the η_{eff} of polystyrene (PS) films supported by silica changes

Download English Version:

<https://daneshyari.com/en/article/5178164>

Download Persian Version:

<https://daneshyari.com/article/5178164>

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