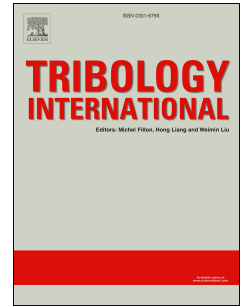


Accepted Manuscript

Enhanced viscoelasticity of polyalphaolefins confined and sheared in submicron-to-nanometer-sized gap range and its dependence on shear rate and temperature

Shintaro Itoh, Yuya Ohta, Kenji Fukuzawa, Hedong Zhang



PII: S0301-679X(17)30580-7

DOI: [10.1016/j.triboint.2017.12.022](https://doi.org/10.1016/j.triboint.2017.12.022)

Reference: JTRI 5006

To appear in: *Tribology International*

Received Date: 16 September 2017

Revised Date: 15 December 2017

Accepted Date: 16 December 2017

Please cite this article as: Itoh S, Ohta Y, Fukuzawa K, Zhang H, Enhanced viscoelasticity of polyalphaolefins confined and sheared in submicron-to-nanometer-sized gap range and its dependence on shear rate and temperature, *Tribology International* (2018), doi: 10.1016/j.triboint.2017.12.022.

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.

Enhanced viscoelasticity of polyalphaolefins confined and sheared in submicron-to-nanometer-sized gap range and its dependence on shear rate and temperature

Shintaro Itoh^a, Yuya Ohta^a, Kenji Fukuzawa^a, and Hedong Zhang^b

^a Department of Micro-Nano Mechanical Science and Engineering, Nagoya University, Furo-cho, Chikusa-ku, Nagoya 464-8603, Japan

^b Department of Complex Systems Science, Nagoya University, Furo-cho, Chikusa-ku, Nagoya 464-8601, Japan

Corresponding author

Shintaro Itoh

Affiliation: Department of Micro-Nano Mechanical Science and Engineering, Nagoya University

E-mail: shintaro.itoh@mae.nagoya-u.ac.jp

Address: Furo-cho, Chikusa-ku, Nagoya 464-8603, Japan

Abstract

The viscoelasticity of polyalphaolefins confined and sheared in a submicron-to-nanometer-sized gap range was measured. A continuous transition from bulk viscosity to confined viscoelasticity was observed in this gap range. The viscosity increased when the gap was less than around 100 nm, whereas the elasticity rapidly increased when the gap was less than 10 nm. The shear rate and temperature dependence of the unique viscoelasticity was also measured in the confined state. The enhanced viscosity decreased as the shear rate and the temperature increased. These findings are expected to improve the basic understanding of hydrodynamic lubrication

Download English Version:

<https://daneshyari.com/en/article/7002044>

Download Persian Version:

<https://daneshyari.com/article/7002044>

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