



1st International Symposium on
Innovative Approaches
in Scientific Studies
April 11-13, 2018 Kemer/Antalya/Turkey

PROCEEDINGS

www.isassymposium.org / symposium.isas@gmail.com



1st International Symposium on Multidisciplinary Studies and Innovative Technologies

1. Uluslararası Multidisipliner Çalışmalar ve Yenilikçi Teknolojiler Sempozyumu

Antalya / Turkey April 11-13, 2018

Typesetting/Dizgi

Assist. Prof. Dr. Turgut ÖZSEVEN

Lecturer Volkan KARACA

Cover Design/Kapak Tasarım

Assist. Prof. Dr. Turgut ÖZSEVEN

Editors/Editörler

Assist. Prof. Dr. Turgut ÖZSEVEN

Lecturer Volkan KARACA

eISSN: 2618-6446

Published by SETSCI

Publication Date: April 20,2018

Organization Committee

- Assist. Prof. Dr. Turgut ÖZSEVEN, Gaziosmanpaşa University, Turkey (*Chairman*)
Assist. Prof. Dr. Ebubekir YAŞAR, Gaziosmanpaşa University, Turkey (*Member*)
Assoc. Prof. Dr. Muharrem DÜĞENCİ, Karabük University, Turkey (*Member*)
Lecturer Hakan ÇOBAN, Gaziosmanpaşa University, Turkey (*Secretary*)
Lecturer Sadık ÖNAL, Gaziosmanpaşa University, Turkey (*Secretary*)
Lecturer Serkan ŞENKAL, Gaziosmanpaşa University, Turkey (*Secretary*)
Lecturer Volkan KARACA, Gaziosmanpaşa University, Turkey (*Secretary*)

Scientific Committee

- Prof. Dr. Erol Eğrioğlu, Giresun University, Turkey
Prof. Dr. Filiz Ersöz, Karabük University, Turkey
Prof. Dr. Fulya Öztaş, Selçuk University, Turkey
Prof. Dr. Güven Çankaya, Ankara Yıldırım Beyazıt University, Turkey
Prof. Dr. Ljiljana Trajkovic, Simon Fraser University, Canada
Prof. Dr. Lucian N. Vintan, University of Sibiu, Romania
Prof. Dr. Mehmet Tekin, Gaziosmanpaşa University, Turkey
Prof. Dr. Ö.Faruk Taşer, Gaziosmanpaşa University, Turkey
Prof. Dr. Pınar Dinç Kalaycı, Gazi University, Turkey
Prof. Dr. Yüksel Taşdemir, Bozok University, Turkey
Assoc. Prof. Dr. Ali Güleç, Süleyman Demirel University, Turkey
Assoc. Prof. Dr. Emina Berbić Kolar, Osijek University, Croatia
Assoc. Prof. Dr. Erkan Kalıpçı, Nevşehir Hacı Bektaş Veli University, Turkey
Assoc. Prof. Dr. Fatma Esra Güneş, Marmara University, Turkey
Assoc. Prof. Dr. Hasan Gül, Kyrgyz Turkish Manas University, Kyrgyzstan
Assoc. Prof. Dr. İlhan Eroğlu, Gaziosmanpaşa University, Turkey
Assoc. Prof. Dr. Nihan Canbakal Ataoğlu, Karadeniz Teknik University, Turkey
Assoc. Prof. Dr. M.Emin Aydın, University of the West of England, UK
Assoc. Prof. Dr. Mahmut Akbolat, Sakarya University, Turkey
Assoc. Prof. Dr. Oktay Yıldız, Karadeniz Teknik University, Turkey
Assoc. Prof. Dr. Sezgin Ersoy, Marmara University, Turkey
Assoc. Prof. Dr. Sevilay Hintistan, Marmara University, Turkey
Assoc. Prof. Dr. Süleyman Bolat, Aksaray University, Turkey
Assist. Prof. Dr. Ali Durmuş, Erciyes University, Turkey
Assoc. Prof. Dr. Azamat Maksüdünov, Kyrgyz Turkish Manas University, Kyrgyzstan
Assist. Prof. Dr. Ebubekir Yaşar, Gaziosmanpaşa University, Turkey
Assist. Prof. Dr. Ediz Güripek, Gaziosmanpaşa University, Turkey
Assist. Prof. Dr. Emin Arslan, Gaziosmanpaşa University, Turkey
Assist. Prof. Dr. Emine Kızıldağ, Ağrı İbrahim Çeçen University, Turkey
Assist. Prof. Dr. Esin Avcı, Giresun University, Turkey
Assist. Prof. Dr. Gültekin Basmacı, Mehmet Akif Ersoy University, Turkey
Assist. Prof. Dr. Halil İbrahim Yumrutaş, Karabük University, Turkey
Assist. Prof. Dr. İnan Keskin, Karabük University, Turkey
Assist. Prof. Dr. Kaveh Ostad-Ali-Askari, Islamic Azad University, Iran
Assist. Prof. Dr. Mehmet Güllü, Gaziosmanpaşa Üniversitesi, Türkiye
Assist. Prof. Dr. Muhammed Baykara, Fırat University, Turkey
Assist. Prof. Dr. Muharrem Düğenci, Karabük University, Turkey
Assist. Prof. Dr. Mustafa Bayram, Gaziosmanpaşa University, Turkey
Assist. Prof. Dr. Mustafa Kısa, Selçuk University, Turkey
Assist. Prof. Dr. Nesrin Karaduman, Bozok University, Turkey
Assist. Prof. Dr. Özgür Koçbulut, Bozok University, Turkey
Assist. Prof. Dr. Seda Nemli, Gümüşhane University, Turkey
Assist. Prof. Dr. Seyil Najimudinova, Kyrgyz Turkish Manas University, Kyrgyzstan
Assist. Prof. Dr. Selda Çalkavur, Kocaeli University, Turkey
Assist. Prof. Dr. Taner Ersöz, Karabük University, Turkey
Assist. Prof. Dr. Turgut Özseven, Gaziosmanpaşa University, Turkey
Assist. Prof. Dr. Vahdet Özkoçak, Hitit University, Turkey
Dr. Hakan Kendir, Gaziosmanpaşa University, Turkey
Dr. Hamza Kandemir, Süleyman Demirel University, Turkey

An investigation into Changes in Lubricant Oil Properties after a Long Term Usage

Ecem Muge Andoglu¹ and Alev Akpınar Borazan^{1*}

¹Department of Chemical Engineering, Bilecik Seyh Edebali University, Turkey

*Corresponding author: alev.akpinar@bilecik.edu.tr

[†]Speaker: alev.akpinar@bilecik.edu.tr

Presentation/Paper Type: Oral / Abstract

Abstract- Lubricant oils are products designed to form a protective film that reduces wear and friction of machinery moving parts, protect against corrosion, cool surfaces, and reduce energy consumption. During operation, lubricant undergoes chemical changes due to contamination and oxidation, decreasing its effectiveness up to a point that no longer meets quality specifications and needs replacement. The main objective of this study is the investigation of the changes in physical and chemical properties of lubricating oils used in different units after a long-term usage. A set of four lubricant oil samples used in the reducers and press machines were collected from different industrial plants. In experimental step density, refractive index, pH, moisture, ash and viscosities at 40 °C were measured after and before usage. According to the experimental results, a significant decrease was observed in the dynamic viscosity of the lubricant oils from the reducers, while a negligible increase was determined in the ones collected from the presses. Besides, no significant change in refractive index and density was found for all samples. Moreover, to determine the changes in color and structure due to usage, UV spectrometer and FT-IR analyzes of both waste and virgin oil samples were also performed.

Keywords- lubricant oil, waste oil, dynamic viscosity, refractive index



1st International Symposium on
Innovative Approaches in Scientific Studies
11-13 April 2018, Antalya, Turkey / www.isassymposium.org

Certificate of Participation

This is to certify that

Alev Akpınar Borazan

has participated in the 1st International Symposium on Innovative Approaches in
Scientific Studies



Paper ID / Title : 184 - An investigation into Changes in Lubricant Oil Properties after a Long-Term Usage
Paper Authors : Ecem Müge Andođlu and Alev Akpınar Borazan
Presentation Type : ORAL

Dr. Turgut Özseven
Symposium Chair

A handwritten signature in black ink, enclosed in a large, hand-drawn oval.





1st International Symposium on
Innovative Approaches in Scientific Studies
11-13 April 2018, Antalya, Turkey / www.isassymposium.org

Certificate of Participation

This is to certify that

Ecem Müge Andođlu

has participated in the 1st International Symposium on Innovative Approaches in
Scientific Studies



Paper ID / Title : 184 - An investigation into Changes in Lubricant Oil Properties after a Long-Term Usage

Paper Authors : Ecem Müge Andođlu and Alev Akpınar Borazan

Presentation Type : ORAL

Dr. Turgut Özseven
Symposium Chair

