



## **A NOVEL POLYMER-SURFACTANT COMPLEX MIXTURE TO IMPROVE DIESEL FUEL FLOW IN A ROTATING DISK APPARATUS**

**Mohamad Amran Mohd Salleh<sup>1,4,\*</sup>, Musaab K. Rashed<sup>1,2</sup>,  
Hayder A. Abdulbari<sup>3</sup> and M. Halim Shah Ismail<sup>1</sup>**

<sup>1</sup>Department of Chemical and Environmental Engineering  
Faculty of Engineering  
Universiti Putra Malaysia  
43300 UPM Serdang, Selangor, Malaysia

<sup>2</sup>Institute of Technology  
Middle Technical University  
Baghdad - Alzafaranya  
P. O. Box: 29008, Iraq

<sup>3</sup>Centre of Excellence for Advanced Research in Fluid Flow  
Universiti Malaysia Pahang  
Gambang, 26300, Kuantan, Pahang, Malaysia  
e-mail: hayder.bari@gmail.com

<sup>4</sup>Material and Processing Technology Laboratory  
Institute of Advanced Technology  
Universiti Putra Malaysia  
43300 UPM Serdang, Selangor, Malaysia

---

Received: March 27, 2016; Accepted: June 12, 2016

2010 Mathematics Subject Classification: 76-XX.

Keywords and phrases: polymer, surfactants, drag reduction, complex mixtures, rotating disk apparatus (RDA).

\*Corresponding author

Communicated by Shahrdad G. Sajjadi