

# 6<sup>th</sup> Global summit on Climate Change

November 19-20, 2018 Paris, France



## Ragab Abd Eltawab

Egyptian Petroleum Research Institute,  
Egypt

### Colloidal stability of eco-friendly sustainable asphalt binder prepared using different waste polymers for different climates

Eco-friendly and sustainable asphalt can be obtained using waste polymers recycled industry and cause severe environmental and climatic problems. In this paper, we studied the effect of waste polymers of different nature and different composition on the colloidal stability of environmentally friendly asphalt for application in different climatic environments. The waste high density polyethylene (WHDPE), waste poly propylene (WPP) and waste polystyrene (WPS) were added in 10% and 15% wt after their evaluation to study the effect on the colloidal stability of the asphalt formed using the chromatography column and HPLC for detecting SARA fraction of prepared modified asphalt. The results showed that the use of polymers of different nature leads to different results. Aliphatic polymers contribute to the increase of colloidal stability due to the increase of saturates and asphaltene, conversely, polymers of aromatic nature contribute to the decrease of colloidal stability due to increasing the proportion of aromatic in the mixture in line with solvent like as like. The research concludes by recommending the use of polymers of aromatic nature to improve asphalt specifications more in cold climates while aliphatic are used in hot climatic zones. This reduces costs and environment problems of waste polymers by using in the preparation of eco-friendly asphalt, according to the principles of sustainable development and climate change.

#### Biography

Ragab Abd Eltawab is a PhD researcher in Asphalt Lab in Petroleum Applications Department, Egyptian Petroleum Research Institute (EPRI). He has completed his PhD in the department of Chemistry, Faculty of Science, Ain-Shams University (2016). He was a board member in Asphalt and Polymer Services Center from 2012 till 2015 and Board Member in Chemical Services and Development Center from 2015 till now. He is a key member of the project "Enhancing Sinai population: Novel modification of soft asphalt for use in roadway network development and infrastructure applications". He has published a book entitled "Environmentally Friendly and Economical Road Construction. "Manufacture of Specific Asphalt Binder for Use in Paving by using waste and low cost materials" LAP LAMBERT Academic Publishing (2014). He has a publication of a chapter in a book entitled "using of waste and low cost materials in manufacture of specific Asphalt binder for use in paving Vol.2: Petrochemical of Adv. in Petroleum Engineering, Studium Press, LLC, USA. (2014). He also published a chapter in a book entitled "Asphalt modified with biomaterials as eco-friendly and sustainable modifiers" publication in the book "Modified Asphalt", under the editorship of Dr. Jose Luis Rivera-Armenta 2018.

chemragab83@yahoo.com

#### Notes: