

Accepted Manuscript

Performance of Hydrophilic Glass Fiber Media to Separate Dispersed Water Drops from Ultra Low Sulfur Diesel Supplemented by Vibrations

Xi Yang, Hua Wang, George G. Chase

PII: S1383-5866(15)30312-9

DOI: <http://dx.doi.org/10.1016/j.seppur.2015.10.062>

Reference: SEPPUR 12666

To appear in: *Separation and Purification Technology*

Received Date: 14 July 2015

Revised Date: 21 October 2015

Accepted Date: 27 October 2015



Please cite this article as: X. Yang, H. Wang, G.G. Chase, Performance of Hydrophilic Glass Fiber Media to Separate Dispersed Water Drops from Ultra Low Sulfur Diesel Supplemented by Vibrations, *Separation and Purification Technology* (2015), doi: <http://dx.doi.org/10.1016/j.seppur.2015.10.062>

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.

Performance of Hydrophilic Glass Fiber Media to Separate Dispersed Water Drops from Ultra Low Sulfur Diesel Supplemented by Vibrations

Xi Yang, Hua Wang, George G. Chase
*Department of Chemical and Biomolecular Engineering,
The University of Akron, Akron, OH 44325-3906*

Abstract

Separation of dispersed water droplets in diesel fuel has received attention in the automotive, aviation, and petrochemical industries. In fuels, especially diesel, water causes corrosion of sensitive engine parts, promotes microbial growth, and can plug injection systems. In this work, we use glass fiber coalescing filters augmented with vibrations to separate the water drops from Ultra Low Sulfur Diesel. As a water-diesel emulsion enters a fibrous filter, the water droplets can be captured or filtered by the fibers. Ensuing droplets carried by the diesel collide with the prior droplets and coalesce to form larger drops. Externally generated vibrations promote the aggregation of water drops on the fibers and the subsequent release of enlarged drops, thus improving the fibrous fiber filtration efficiency. This work discusses fabrication, characterization, effects of vibration direction, and experimental results. Water separation experiments showed that glass fiber mats improved water separation by vibration, especially at frequency 100 Hz in the horizontal direction, with water removal efficiencies reaching beyond 95%, as compared to efficiency of about 69% for glass fiber media without vibration.

Keywords: hydrophilic, filter media, glass fibers, diesel, vibration

Download English Version:

<https://daneshyari.com/en/article/10389730>

Download Persian Version:

<https://daneshyari.com/article/10389730>

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