

## **S2.4.4 OBSERVATION OF WATER DROP MOVEMENTS BETWEEN LAYERS OF HYDROPHOBIC-HYDROPHILIC FIBER MEDIA SUBMERGED IN DIESEL**

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The motions of water drops in organic liquids are prevalent in nature and industrial processes. Observation of how drops move can improve our understanding of the phenomena. Improved understanding of drop motions helps us to better design and engineer processes for specific applications such as coalescence of water drops in diesel fuels.

Water in diesel fuel is problematic because it can cause engine damage and reduce engine performance and is the motivation for studying these liquids. In this work the water drops submerged in Ultra Low Sulfur Diesel fuel are observed via microscope. The experiments are design to observe the drops as they pass through layers of fiber media on a custom made media holder. Of particular interest is how the drops interact with each other and with the fiber media when the wetting of the properties of the media layers alternate between hydrophilic and hydrophobic. The experiments are conducted with flow of diesel fuel flowing across the field of view. Parameters and mechanisms affecting droplet coalescence and breakup are discussed.