

CHEMICAL BEHAVIOR OF TRIBOFILM EXPOSED TO FUEL SURROGATES DURING RUBBING

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ABSTRACT

Tribofilm formation under boundary lubrication regime is a result of chemical reaction involving materials of the contact surfaces and lubricants. Heavy fuels have gained importance in studies on their implications in internal combustion engines. To investigate the effect of chemical changes due to heavy fuels presence, a MTM (Mini Traction Machine) test with in-situ Raman spectroscopy is used to study the evolution of tribofilm's chemistry during rubbing. This method enables to find correlations between chemistry and friction. It will be presented firstly the effects of only heavy fuel surrogates and secondly the effects of heavy fuel surrogates and lubricant mixture on a steel contact. The role of temperature, gas environment and shear will be shown. The base fluids of interest include iso-octane, octane and other surrogates related to heavy fuels.

Keywords: engine, drive train, lubrication fundamentals, fuel surrogates, Raman spectra