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Rheological and Tribological Behavior of Sunflower Oil: Effect of Chemical Modification and Tungsten DiSulfide Nanoparticles

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Abstract

This paper aims to evaluate the tribological characteristics of WS_2 nanoparticles in modified sunflower oil. The modification is done by epoxidation method in order to decrease the unsaturation of the sunflower oil. Further, tungsten disulfide (WS_2) nanoparticles were added in modified sunflower oil to evaluate its effect on the rheological and tribological properties. The nanoparticles were added in 0.5 wt% and 1 wt% concentrations. The experimentation was performed on pin-on-disk tribometer with liquid metal alloy/steel contact pairs. The rheological properties were obtained with varying shear rates from 1 to 1000 1/s. Stribeck curves were generated for virgin sunflower oil, modified sunflower oil and the modified oil containing nanoparticles in mixed