

Evaluation of tribological performance of aged and unaged biodiesel

Authors : Yuan-Ching Lin, Tian-Yi Huang, Ming-Jhe Hsieh

Abstract : In this work, soybean biodiesel was blended with petroleum diesel as testing oils (B2). The tribological performance of the B2 biodiesel before and after aging was evaluated using a reciprocating cylinder-on-flat wear test rig (Cameron-Plint TE-77) at various temperatures. The worn surface of each tested specimen was observed using a field-emission scanning electron microscope (FESEM). The compositions of the chemical films on each worn surface were determined using an energy dispersive spectrometer (EDS). The experimental results demonstrate that the tribological behavior of the B2 was superior to that of other testing oils. Furthermore, the aging of biodiesel caused acidification, which resulted in poorer wear performance in the same experimental condition compared with others. The worn morphology of the specimen that was tested in the aged soybean biodiesel exhibited corrosion wear, reflecting low wear resistance.

Keywords : biodiesel, soybean, tribological performance

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