

# Effect of SiC nanoparticles concentration on novel feedstock *Moringa Oleifera* chemically treated with neopentylglycol and their tribological behavior

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## ABSTRACT

The increase in energy demand and deterioration of the petroleum products encouraged industrialists to search for environmentally friendly products. In this study, an attempt has been made to explore the potential of *Moringa Oleifera* oil for bio-based lubricant application. The *Moringa Oleifera* oil was modified through the chemical process with Neopentylglycol treatment. After chemical modification, the nanoparticles were added to the oil in different proportions. The physicochemical properties of the lubricants were tested according to the ASTM standards. The tribological application was examined using a pin on disc tribometer. For the examination of the worn surfaces, a scanning electron microscope was used. An improvement in the physicochemical properties of the lubricant was observed at 0.5% concentration. Increment in viscosity increment, relative viscosity becomes more at 1.0% nanoparticles concentration and 100 °C temperature. The proper dispersion at 0.5% nanoparticles addition was obtained and confirmed through the test. The reduction in the friction coefficient and wear of the parts was observed with chemically modified oil and optimum concentration of the 0.5% nanoparticles was found. The 1.0% concentration of nanoparticles showed higher wear of the parts due to their agglomeration on the surface. The worn surfaces during 0.5% nanoparticles addition to the lubricant also display minimum wear.

**KEYWORDS:** Neopentylglycol; Nanoparticles; Additives; Friction; Wear

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