THE TRIBOLOGICAL PERFORMANCE OF GREEN SHEA BUTTER

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Abstract

Shea butter is a natural fat extracted from the nut of the African shea tree (Vitellaria paradoxa). Shea butter is extensively used in traditional (cooking oil, waterproofing wax, hairdressing, candle making), Industrial (cosmetic, soap) and medicinal (ointments) applications. As there is an increased demand for green lubricants due to environmental concern, this lubricant can be used as an alternative to the petroleum-based grease in many industrial applications such as green manufacturing, power generation, and automotive industries. So far, the tribological performance of this green lubricant is unknown to the tribological community. Hence, the purpose of this study is to evaluate the lubricating performances of green shea butter with a view to utilizing it as a possible alternative to petroleum-based lubricants in industrial applications including manufacturing, power generation, and automotive industries. In the present investigation, a comprehensive evaluation of the lubricating performance of industrial green shea butter was made under various loads, velocities and temperatures using pin-on-disk, four-ball and block-on-ring apparatus. Based on the analyses, it can be deduced that this novel lubricant can replace the conventional lubricant and can be effectively used in manufacturing, power generation, and automotive industries.