Green Tribology: Present Trends and Future Directions

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1 Abstract

Tribology is a fundamental aspect of engineering, playing a critical role in reducing friction, wear, and energy losses in mechanical systems. Green tribology focuses on developing sustainable and environmentally friendly solutions to reduce friction, wear, and energy losses in mechanical systems.[1] While lubrication plays a crucial role in enhancing machine efficiency, many conventional lubricants contribute to environmental pollution due to their non-biodegradable nature and toxic byproducts.[2] This study aims to analyze the current landscape of biodegradable lubricants, assessing their efficiency and feasibility as sustainable alternatives. Furthermore, the research explores the enhancement of lubricant viscosity through the incorporation of nanoparticles and examines their tribological performance under varying temperature conditions[3]. By investigating these factors, this study contributes to the advancement of green tribology by promoting eco-friendly lubrication technologies that balance performance and sustainability.

2 Key Objectives

- **Assess the current state of biodegradable lubricants** and their effectiveness in reducing friction and wear.
- **Investigate the role of nanoparticles** in enhancing lubricant viscosity and improving tribological performance.
- **Analyze the impact of temperature variations** on the efficiency of biodegradable lubricants.
- **Contribute to the development of sustainable lubrication** solutions that align with green tribology principles.

References

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