

Preparation of Sodium Grease using Used Transformer Oil

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Abstract:

This study aimed to prepare sodium grease using used transformer oil as base oil and investigate the prepared grease properties. Oil, whether it is new or used, is a significant contributor to water pollution due to its toxicity towards the environment. In this study, used transformer oil (UTO) is utilized as grease's base oil. The properties of the grease were evaluated in term of their consistency, drop point, bleed oil, and oil separation in accordance to ASTM standard testing method. The grease also characterized by using FTIR-ATR approach. The results show that the grease can be formulated using UTO with significant grease properties of >180°C dropping point, -15% to +15% of oil bleeding at both 25°C and 70°C, no separated oil during storage, and slightly tarnish on copper strip. The best UTO-based sodium grease formulation was 67.5:32.5 of oil-to-thickener ratio and classified as NLGI 2 grease. Moreover, FTIR spectrums shows no contaminants or unknown chemical changes or additive in UTO and the prepared grease. The addition of MoS₂ in grease shows no significant improvement in sodium grease properties. Thus, UTO was able to work as grease base oil and exhibited overall good properties but, UTO-based greases analysis on its tribology is necessary to study the prepared grease performances during operation.

Keywords: Used Transformer Oil (UTO); FTIR-ATR approach; Grease Performances

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