

CHAPTER V

CONCLUSION

In this research, lithium-TMP ester grease (82 % TMP-ester oil and 18 % lithium stearate) and lithium-paraffin grease (85 % paraffin oil and 15 % lithium stearate) were prepared. From scanning electron microscopy, the prepared greases contained a short fiber ($0.1\ \mu\text{m} \times 0.5\ \mu\text{m}$) of lithium stearate which is a thickening agent.

Three types of additives (ZDDP, MDTC and DPA) were separately added into the greases to improve oxidation stability. Results showed that (i) the same amount of additives gave insignificant difference in oxidation stability of the prepared greases, and (ii) 2 % of additives were found to be suitable as ingredient in the prepared greases. The similar properties were obtained for the prepared lithium greases using base oils as TMP ester oil and paraffin oil. The prepared greases have good oxidation, mechanical and thermal stabilities.

The prepared lithium greases containing 2 % of additives (ZDDP, MDTC or DPA) were found to have the penetration range 227 to 229, classified as NLGI number 3 which has penetration number 220-250. This indicates that the prepared greases, in this research can be used for rolling bearing of a spindle motor.

In addition, the prepared greases have good corrosion resistance and low concentration of volatile organic compounds under computer application, leading to low contaminants in a computer system. Moreover, the prepared greases were found to have as good properties as the commercial greases.

In conclusion, the lithium grease may be prepared from base oils as paraffin oil or TMP-ester oil, and 2 % additives as ZDDP, MDTC or DPA.

In the future work, the improvement of extreme pressure properties of the grease used for bearing designed for high load application could be investigated by increasing the amount of ZDDP and MDTC. However both additives contain sulfur compounds which may cause high corrosion for metals of bearing. Thus an anti-corrosion agent in the grease may be required.



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