CONCLUSIONS

The initiation step in autoxidation of base lube oils is apparently dependent on the structure of their components, aromatics are easily oxidized than the paraffins. Sulphur and nitrogen compounds play a significant role in the oxidation of base lube oils.

Sulphur compounds contribute to instability by catalizing the formation and decomposition of hydroperoxide. Disulphides in addition to being insoluble in many cases, apparently form intermediate free radicals that decompose to more reactive sulphur derivatives.

The basic nitrogen constituents of lube oils are stable species and would not be expected to oxidize readily while the non-basic nitrogen constituents are highly susceptible to autoxidation.

Copper seems to be more active in oxidation of oils than the other metals due to its high solubility in the oil if compared with other metals.

It was recognized that the action of metal in solution as salts, could be quite different from that of the bulk or massive metals. The ions of the soluble metals

react directly with oxidation products forming soaps. But metallic surface exist only in so far as the metal ions go into oil medium forming metal oxide and further initiate the rate of reactions.

Metals should be more active as an initiation in polar media. It is found that in presence of basic nitrogen form an oxygen complex which is reversible and is an excellent oxidation catalyst.

In the later stage of oxidation oil with a cobalt and iron ions have a higher deterioration effect than oil with the same concentration of copper ions. This is mainly due to the fact that their ions have a higher equivalent numbers than copper ion. Moreover, simple organic compounds which are formed with oxidation products and copper ions are more dissociatable than those formed with cobalt and iron.

Base lube oil No. 3 is liable to be oxidized more easly than the other two oils due to its chemical composition which is characterized by a high percent of aromatics and sulphur bearing compounds.