CHAPTER V

CONCLUSION

The first step in this study, isoamyl alcohol was converted to DPDA by reaction with P_2S_5 at a molar ratio of 4:1.2. The yield of DPDA was 94 % for isoamyl alcohol, 93 % for n-butanol, 92 % for 2-ethyl hexanol and 90 % for n-octanol In the second step, DPDA from isoamyl alcohol was used to react with metal oxides to synthesize MDDP. It was shown that the appropriate metals for synthesis of MDDP were ZnO and CuO. For the synthesis of ZDDP, a molar ratio of ZnO and DPDA was 1:1 and for the synthesis of CuDDP, a molar ratio of CuO and DPDA was 0.8:1. The conversions were 94 % for ZDDP and 89 % for CuDDP.

In anti-oxidation performance, ZDDP and CuDDP from isoamyl alcohol showed a good anti-oxidation property. The optimum quantity of ZDDP and CuDDP that show the best performance were 1% concentration. At this concentration, CuDDP showed a better performance than ZDDP, about 40 °C. By comparison with commercial ZDDP L4952, CuDDP was used less quantity than commercial ZDDP to increase oxidation temperature about 72 °C.

From the results, CuDDP could be applied to use as a new antioxidant which had a good thermal stability property in lubricating oil.