CHAPTER 5 CONCLUSIONS AND SUGGESTIONS FOR FUTURE WORKS

5.1 CONCLUSIONS

The one-pot method may be used to prepare copper(II) mixed-carboxylate complexes of general formula $[Cu_2(p\text{-}H_2NC_6H_4COO)_n(CH_3(CH_2)_{14}COO)_{4-n}]$ (n = 1-3). The copper(II) salts suitable for the synthesis were $Cu(NO_3)_2$, $[Cu(CH_3COO)_2]$ and $CuSO_4$, and not $CuCl_2$. The reaction involving $[Cu(CH_3COO)_2]$ was better due to the higher yield obtained.

All complexes were binuclear with square pyramidal geometry at Cu(II) centers. Their thermal stabilities were higher than 200^{o}C. The complexes melted at around 118^{o}C except for the **Complex 4** and **Complex 5** which did not melt. It is noticed that **Complex 1** and **Complex 6** showed thermotropic mesogenic properties, exhibiting smectic C (SmC) mesophase upon cooling to room temperature.

All complexes were magnetic; antiferromagnetic (**Complex 1** and **Complex 2**) or ferromagnetic properties (**Complex 3**, **Complex 4** and **Complex 6**). These complexes were redox active and underwent a quasireversible redox and chemical reactions (the EC mechanism).

5.2 SUGGESTIONS FOR FUTURE WORKS

The one-pot reaction seems to be suitable to synthesized the binuclear copper(II) mixed-carboxylates complexes, and should be further optimized, and extended to

other metal(II) mixed carboxylates (chromium(II), manganese(II), iron(II), iron(III) and cobalt(II)), and to mixed-metal carboxylates.

The structure of these complexes should be ascertained by more direct methods, such as single crystal X-ray crystallography.

The linear alkylcarboxylate ligands may be replaced by branched alkylcarbolyates, and the arylcarboxylate ligands may be substituted with other functional groups with different electronic effects, or with alkyl or alkoxy chains to reduce the melting temperatures of the complexes.

The magnetic properties of these complexes should be studied at different temperatures by SQUID magnetometer, as well as for complexes after the development of the optical texture. It would also be interesting to study the electronic, photonic and catalytic properties of these metallomesogens.