CHAPTER 5
CONCLUSION AND SUGGESTIONS OF FUTURE WORKS

5.1 Conclusion

Copper(II) benzoate (CB) decomposed gradually at 243.5 °C to 515 °C with total weight loss of 67.7 %. The decomposition process involved breaking of bridging bonds between the ligand and copper(II) ions, followed by formation of volatiles from the decomposition of the radical formed from the ligand, and finally the breaking of copper-copper bonds.

The derivatives of CB containing electron-attracting substituent, namely fluoro, chloro, bromo, iodo, pentafluoro, nitro and dinitro are thermally more stable than CB. The higher thermal stability is due to resonance stabilization of the ligands.

The dinitro derivative is the most thermally stable while the pentafluoro derivative the least stable among all derivatives studied. The order of thermal stability is:

decreasing stability ↓

copper(II) 3,5-dinitrobenzoate
copper(II) 4-nitrobenzoate
copper(II) 4-bromobenzoate
copper(II) 4-chlorobenzoate
copper(II) 4-iodobenzoate
copper(II) 4-fluorobenzoate
copper(II) pentafluorobenzoate
copper(II) benzoate

5.2 Suggestions of Future Works

Future work that may be suggested is to study the structure of copper(II) benzoate and its derivatives by X-ray crystallography (XRC), X-ray diffraction (XRD), Scanning Electron Microscopy (SEM) and Fourier Transform Infrared Spectroscopy (FTIR). It would be beneficial to study the effect of other substituents such as electron-donating substituents, disubstituted and fully substituted derivatives on the thermal stability of the materials.