CHAPTER 6

CONCLUSIONS AND SUGGESTIONS FOR FUTURE WORK

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6.1 Conclusions

Six new Schiff bases were successfully obtained from the reaction of 4-phenyl-1,3,5-triazine-2,6-diamine with 5-chlorosalicyladehyde (H_2L1), 5-bromosalicyladehyde (H_2L2), 5-nitrosalicyladehyde (H_2L3), 3-hydroxysalicyladehyde (H_2L4), 4-hydroxysalicyladehyde (H_2L5), and 3,5-di-*tert*-butylsalicyladehyde (H_2L6), according to the published method.

Each Schiff base was then reacted with Ni(II), Cu(II), and Zn(II) acetates to the corresponding complexes. A total of 18 complexes were obtained.

The Schiff bases were characterized by elemental analyses (CHN), Fourier transform infrared spectroscopy (FT-IR), ^{1}H- and ^{13}C- nuclear magnetic resonance spectroscopy (NMR), and ultraviolet-visible spectroscopy (UV-vis), while the complexes were additionally characterized by CHN, FT-IR, UV-vis and thermogravimetric analysis (TGA).

All Ni(II) complexes are octahedral, all Cu(II) complexes are square pyramidal, and all Zn(II) complexes are tetrahedral.

The thermal stabilities of Ni(II) and Cu(II) complexes of H_2L1, H_2L2, H_2L3 and H_2L6 are similar (245-255^{o}C), but slightly higher than those of the corresponding Zn(II) complexes (225-230^{o}C), and significantly higher than those of H_2L4 and H_2L5 (200-210^{o}C)

The antioxidant activities of the Schiff bases and their complexes were measured in terms of their radical scavenging ability towards diphenylpicrylhydrazyl free radical (DPPH) and ferric reducing ability power (FRAP). All of the Schiff bases studied have higher antioxidant activities compared to the corresponding complexes.

The Schiff bases with the highest antioxidant activities are H_2L4 and H_2L5, while the complexes with the highest antioxidant activities are NiL4 and NiL5. The antioxidant activities increase with concentration of the compounds.

6.2 Suggestions for future work

It is suggested that other analytical techniques are used to confirm the structure of the metal complexes studied, such as electrospray ionization-mass spectrometry (ESI-MS) and X-ray crystallography.

It would be important to ascertain the antioxidant mechanism of both the Sciff bases and their complexes by using other substituents, such as fluorine, iodine, and linear alkyl chain.

The structural, thermal and biological activities of complexes from these Schiff bases may be extended to other metal ions, such as Co(II) and Fe(II).

The Schiff bases and the metal complexes may be tested for other biological applications, such as antibacterial, antifungal, and antiulcer.