

CHAPTER IV

CONCLUSION

meso-Tetraarylporphyrins including the 5,10,15,20-tetraphenylporphyrin (TPP), 5-(pyridyl)-10,15,20-triphenylporphyrin (MPyTPP), 5,15-(dipyridyl)-10,20-diphenylporphyrin (*trans*-DPyDPP), 5,10-(dipyridyl)-15,20-diphenylporphyrin (*cis*-DPyDPP), 5,10,15-(tripyrindyl)-20-phenylporphyrin (TPyMPP), and 5,10,15,20-tetrapyrindylporphyrin (TPyP), have been successfully synthesized by using pyrrole, benzaldehyde, and 4-pyridinecarboxaldehyde at a 4:2:2 ratio. With this ratio an increased amount of the desired MPyTPP was afforded in 36% yield. The transition metal complexes of TPP and MPyTPP have been successfully prepared by reacting the acetate salts of Mn(II), Co(II), Ni(II), Cu(II), Zn(II), and chloride salt of Fe(III) in methanol to either chloroform or *N,N*-dimethylformamide a solution of porphyrin. The complexation was determined to reach its completeness as evidenced by a change in the results from UV/Visible measurement in CHCl₃ and disappeared signals of inner NH protons in ¹H NMR measurement.

Dimeric porphyrin side to face complexation, (ZnTPP)(MPyTPP) and (CoTPP)(MPyTPP) were synthesized insitu in an NMR tube. ¹H NMR spectra indicated that 2,6-pyridyl and 3,5-pyridyl protons of MPyTPP largely upfield shift and β -pyrrole protons of MPyTPP were split out. In addition, results from MALDI-TOF-MS analysis also confirmed the formation of the (ZnTPP)(MPyTPP) and (CoTPP)(MPyTPP). Finally, thin film ZnTPP (**2**) has been used as optical-responsive chemically interacting materials for the detection of various alcohols.