CHAPTER I

INTRODUCTION

Chemistry of inclusion compounds has received much interest owing to their unique molecular assembly between host and guest species stabilized by the secondary forces, i.e., van der Waals, hydrophilic and/or hydrophobic interaction, ionic interaction, dipole-dipole interaction, etc. Structural characterization in liquid and solid states proved that host compounds provide the concave structure for guests of which can either be neutral molecules or ionic ions. It has been known that crown ethers, cyclodextrins, calixarenes, steroids and the related compounds exhibit inclusion properties for decades. The practical applications can be raised as the improvement of solubility of particular organic species, the exclusion of impurity from the mixtures, the ionic catalyst, the inclusion polymerization, etc.

Recently, Chirachanchai *et al.* focused on benzoxazines and the open ring oligobenzoxazine derivatives and proposed them as a novel type of host compound via the resemble structure to calixarenes and/or pseudocyclic calixarenes. In the preliminary studies, it was found that benzoxazine monomers and their derivatives perform inclusion phenomena by interacting with alkali and alkaline earth metal ions. Due to the unique structure of benzoxazines, electron rich position at N and O atoms are the attracted position to occur interaction with metal ion. Therefore, from this main reason it is interesting to study the host-guest chemistry of benzoxazines. However, the inclusion phenomena induced by the benzoxazine structures are still unknown.

Thus, the present work was designed to clarify the origin of the host guest properties of benzoxazines. A series of monomers and dimers were prepared and studied by varying the structure of starting materials, phenol

derivatives and amine types, systematically. The host-metal interactions were characterized by means of ultraviolet spectroscopy, ^{1}H-NMR, mass spectroscopy, and X-ray diffraction.