

Attaphon Kaewvilai 2009: Designs and Developments of Novel Ion Extraction Materials based on Supramolecular Properties of Benzoxazine Derivatives. Master of Engineering (Materials Engineering), Major Field: Materials Engineering, Department of Materials Engineering. Thesis Advisor: Assistant Professor Apirat Laobuthee, Ph.D. 60 pages.

In this present work, three types of benzoxazine supramolecules with ring closure, open ring and etherified benzoxazines were synthesized. The ring closure (**BX1-BX3**) and open ring (**BX4-BX6**) benzoxazines with linear aliphatic linkage were prepared by Mannich reaction and ring opening reaction, respectively. Both reactions were also simple and effective reactions without using any specific catalysts to produce high yield products. Additionally, we successfully prepared the etherified benzoxazine (**BX7- BX9**) via molecular design based on benzoxazine dimer structure. By using a reaction of etherification, the desired products with high yield were obtained. The all chemical structures of products were confirmed by FT-IR, $^1\text{H-NMR}$ and MS. The all products exhibited the unique property as supramolecules to interact with alkali metal ions via the molecular assembly were observed by Pedersen's technique. In this case, the results indicated that etherified benzoxazines (**BX7, BX8** and **BX9**) shows stoichiometrically interacted with metal ion guest as 2:1, 3:1 and 4:1, respectively.

Keywords: Supramolecule, Molecular assembly Benzoxazines, Mannich reaction, Ring opening reaction, Etherification, Pedersen's technique, stoichiometric interaction ratio.

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