

Anion Recognition of 2,3-Disubstituted Cyclodextrin Derivatives in a Mixed Solvent of Acetonitrile and Water

Nobuyuki KARUBE and Kazuaki ITO*

* Department of Chemistry and Chemical Engineering, Graduate School of Science and Engineering, Yamagata University, Jyonan 4-3-16, Yonezawa 992-8510, Japan

E-mail : itokazu@yz.yamagata-u.ac.jp

In this study, we investigated the use of cyclodextrins (CDs) as scaffolds for constructing anion receptors. We synthesized modified α - and β -CDs (**1-3**), in which the hydroxyls on C-2 and C-3 are protected by benzyl, acetyl, or propionyl groups; moreover, we investigated their anion binding properties in CD_3CN or $\text{CD}_3\text{CN}/\text{D}_2\text{O}$ (99/1, v/v) using $^1\text{H-NMR}$ titration experiments. The results demonstrate that CD-based receptors (**1-3**) effectively bind with AcO^- and H_2PO_4^- by cooperative intermolecular hydrogen bondings with alcoholic hydroxyl groups on C-6. The selectivity trends thought to be a function of the basicity of the anions and the size of the binding pocket in the receptors.

Key Words : Cyclodextrin, Anion receptor, Hydrogen bonding, Hydroxyl group, Acetate, Dihydrogen phosphate