SYNTHESIS OF THE HOST MOLECULE HAVING CROWN ETHER AND CYCLOPHANE UNITS

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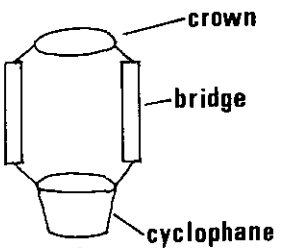
Synthesis and complexation of cylindrical macropolycyclic host molecule, of which schematical shape is shown in Fig. 1, is reported. The host consists of crown and cyclophane units and two bridges. The molecular assembly of **1** has two kinds of binding forces such as electrostatic and hydrophobic interactions. By means of combining these interactions, **1** (host) is expected to include a substrate (guest) in a high specificity.



1

Fig.1

Each unit was individually prepared, and then they were condensed stepwise. As the crown units dibenzo-18-crown-6 and 18-azacrown-6 were used. To introduce functions which are reactive with the bridges in dibenzo-18-crown-6, nitration, reduction, and *N*-tosylation were carried out successively to give *trans*-bis(*p*-toluenesulfonamido)dibenzo-18-crown-6 in 30% total yield. Azacrown is considered to be of great interest since it is able to complex both anion and cation. Two rigid bridges which are defferent in length were synthesized. Rigidity of the bridge holds the cavity firm. A novel cyclophane was prepared by 2:2 cyclization of bisphenol A and 3,5-bis(bromomethyl)nitrobenzene derived from 3,5-dimethylnitorobenzene. The synthesis of the 2:2 cyclized cyclophane was achieved when the stepwise cyclization *via* U shaped precursor was performed.

From the NMR spectrum it is suggested that the cyclophane formed 1:1 inclusion complex with benzene. Moreover, the shape of the cavity of this compound was found to be similar to those of cyclodextrins.

Since the cyclophane unit is capable of including uncharged organic guest molecule, this system **1** is expected to accomplish a great ability of specific inclusions.