SYNTHESIS AND PROPERTIES OF WATER-SOLUBLE BIS-PARACYCLOPHANES

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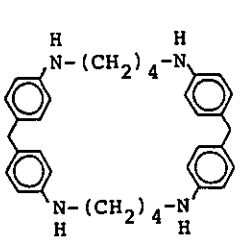
Host molecules with multiple independent binding sites, capable of forming complexes with multiple guest molecules simultaneously, or with a single guest molecule at multiple sites cooperatively, are of particular interests in relation to assembling and recognizing molecules and/or ions by complexation.

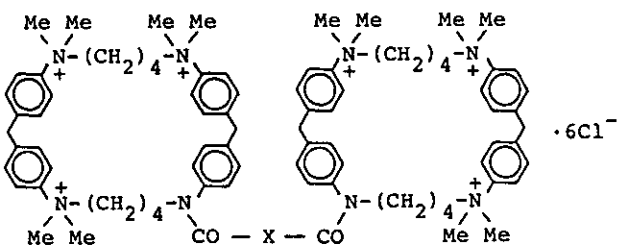
Water-soluble paracyclophanes such as 1 having two diphenylmethane skeletons are known to form inclusion complexes with aromatic guest molecules in aqueous solution in particular geometries and with remarkable selectivities. The present paper describes the synthesis of novel water-soluble bis-papacyclophanes (2, 3, 4) having two paracyclophane units bridged by glutaryl, terephthaloyl, or isophthaloyl residue, and their properties as hosts having two independent binding sites.

Complex formation between these bis-paracyclophanes and several guest molecules was investigated by ^{1}H NMR in D_2O.

Examples are presented in which these bis-paracyclophanes form complexes with a guest molecule having two aromatic rings connected by oligo-ether bridges at two sites cooperatively, when host and guest are complementary.



1



2 : X = $-(CH_2)_3-$

3 : X = 

4 : X =