

## ABSTRACT

The first part of this project involved the non-conventional approach to build a large molecular system called [2]rotaxane. The methodology exploited the use of non-covalent interactions to build the supramolecular assembly, [2]rotaxane.

In the second part of this project, fluorescence studies on metal ions ( $\text{Na}^+$ ,  $\text{K}^+$  and  $\text{Cs}^+$ ) bound large aromatic crown ether, bis-1,5-(naphtha)-38-crown-10 were also investigated.

In the final part, HyperChem computational package was used to search the conformations and stabilities of the crown ether, bis-1,5-(naphtha)-38-crown-10, in gas phase and "host-guest" interactions of this crown ether (host) were studied with pyromellitic diimide (guest) using molecular mechanics  $\text{MM}^+$  method.