

Publication

A Modular Phosphorylated Glycoluril-Derived Molecular Tweezer for Potent Binding of Aliphatic Diamines

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A molecular tweezer based on a glycoluril-derived framework bearing four phosphate groups was synthesized and shown to be capable of binding organic amines in aqueous solution. This work reports the K values for 30 complexes of this molecular tweezer and amine guests, determined by means of ^1H NMR titrations. Both the hydrophobic cavity and the phosphate groups contribute to the binding. Bulkier molecules and molecules bearing negatively charged groups like carboxylates in amino acids bind less tightly due to steric clash and coulombic repulsion. The narrow cavity and the strong ionic interactions of the phosphate groups with ammonium guests favor binding of aliphatic diamines. These binding properties clearly distinguish this system from structurally related molecular clips and tweezers.

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