Synthesis of Azobenzene-Containing Salen-Based Macrocycle

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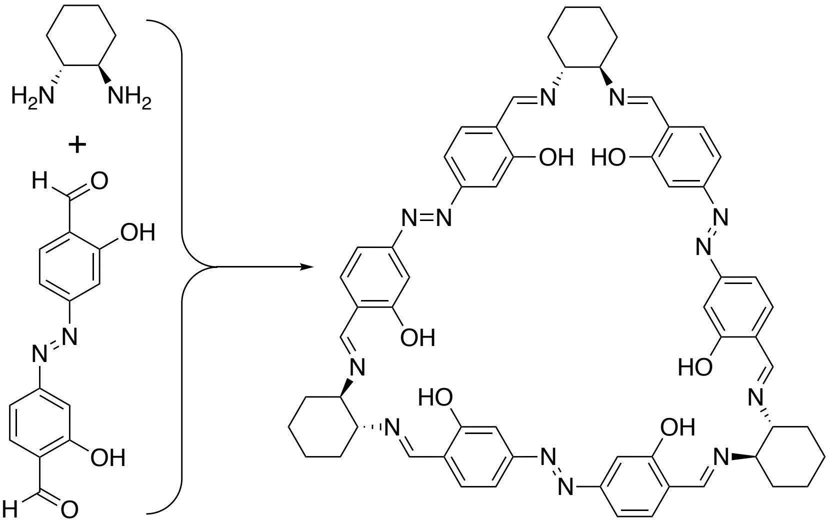
Keywords: Salen; Macrocycle; Azobenzene; Responsive Materials; Supramolecule

Macrocyclic receptors are capable of strongly binding guests, but for some applications such as sensors and catalysts, it is desirable for the binding to be reversible. The binding can often be reversed through heating, adding competing ligands, or changing solvents. These methods are not always repetitive or practical, so we set out to design a receptor that could bind guests with binding affinities that can be regulated with irradiation of light.

It is known that the reaction of a diamine and a bis-salicylaldehyde linker with its formyl group in the 180° position yields a triangular cyclic trimer with salen units at its vertexes.[1] Salen complexes can act as recognition sites that can bind guests through coordination in the axial site.[2] As a light-responsive unit, we chose azobenzene[3] that provides the ability to switch its backbone based on photoisomerization. In this work, a new azobenzene derivative **1**, whose two salicylaldehyde units are directly connected by the azo group, was designed and synthesized. The azobenzene bis-salicylaldehyde **1** was reacted with (1*R*,2*R*)-cyclohexanediamine to form azobenzene-containing salen-based macrocycle H_6**2**. Characterization of H_6**2**, macrocyclization trials with different diamines, metal complexation, and the photochemical properties including photoisomerization will be discussed in the presentation.



1 H_6**2**

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