

Controlling Photochemistry with Weak Non-Covalent Forces and Confined Spaces

V. Ramamurthy
Department of Chemistry
University of Miami
Coral Gables, FL 33124

Life sustaining highly specific chemical reactions occur in the confined and organized medium of protein. Our projects aimed at achieving similar selectivity in photochemical reactions explore the use of readily available hosts that bear similarity to biological environment. In our laboratory, spatially confined cavities provided by crystals, zeolites, and water-soluble cyclodextrins (natural and functionalized), organic hosts such as cucurbiturils, cavitands, cholic acid micelles, and dendrimers are currently being explored as reaction media.

In this talk selectivities obtained in photoreactions conducted in aqueous medium using a water soluble deep cavity cavitand (octa acid) as host (shown below) will be presented. Photofragmentation of dibenzyl ketones, geometric isomerization of stilbenes, singlet oxygen mediated oxidation of cyclic olefins would be used as examples to illustrate the power of a confined space and weak C-H \cdots π interaction in controlling chemistry.

