

ST-Supramolecular Chemistry

Chemistry 856

Section: G100

Term: 2001 Fall

Instructor: Dr. N.R. Branda. Office: C9016B

Discussion Topics: General Course Description:

The course will consist of in-depth discussions about the physical properties and use of non-covalent interactions in natural and synthetic systems. The use of these interactions to design successful catalysts and enzyme mimics, molecular transporters and functional materials will be evaluated by surveying the current literature.

3 lecture hours/week; 1 tutorial hour/week; 0 lab hours.

Topics:

Appreciating supramolecular chemistry hinges on a good understanding of the non-covalent driving forces that can be utilized to unite molecules. We will, therefore, begin the course by examining the common intermolecular forces used in molecular recognition chemistry:

the hydrogen bond,

van der Waal's contacts,

p-p stacking,

the hydrophobic effect,

and to a lesser extent metal coordination (including cation-p interactions).

After our discussions on the physical properties of these interactions (strength, directionality, environmental limitations), we will take a closer look at how these interactions can be used in

host-guest chemistry (the selective binding, catalysis and transport of substrates),

self-assembly synthesis (the construction of well-ordered aggregates under thermodynamic control),

and functional materials and devices.

Grading: 25% Oral presentation (one from each student)

25% Midterm Examination

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50% Final Examination

Required Texts: None. There will be a text on reserve in the Library:

"Supramolecular Chemistry", Jonathan W. Steed and Jerry L. Atwood,
John Wiley & Sons Ltd., 2000.

Recommended Texts: None.

Materials/Supplies: None.

Prerequisite/Corequisite: None.

Notes: None.

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