

## GDCh- und Chemisches Kolloquium

Der GDCh-Ortsverband Oldenburg und das Institut für Reine und Angewandte Chemie der Carl von Ossietzky Universität Oldenburg laden zu einem Vortrag

**von** Prof. Dr. Kenneth N. Raymond, University of California Berkeley

**zum Thema** Chemistry in Nanoscale, Chiral Flasks

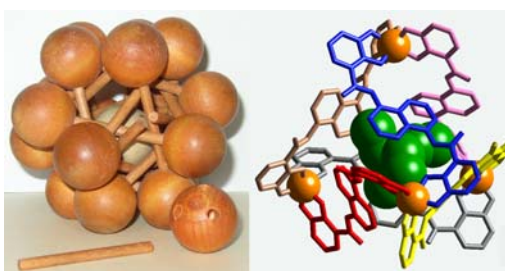
herzlich ein.

**Termin:** Montag, den 24.10.2005, 17.00 Uhr c.t.

Hörsaal W3 1-156

Carl-von-Ossietzky-Straße 9-11

**Einladender** PD. Dr. Arne Lützen



The wooden puzzle with structural memory: despite dissociation of several components the labile assembly maintains its structure. A similar phenomenon is observed in the  $M_4L_6$  assembly at the right, despite dissociation the tetrahedral structure is maintained.

Replacement of components of the cluster after such resolution shows a structural memory of the assembly with the optical activity unabated

Up to a 75% diastereomeric excess has been observed in the encapsulation of a planar chiral catalyst by such clusters, and C-H bond activation has been seen. A supramolecular metal-ligand assembly catalyzes the [3,3]-sigmatropic rearrangement of enammonium guests in aqueous solution by up to 1000 fold. The space restrictive host cavity forces the substrates to bind in a reactive chair-like conformation and thus accelerates the rates of rearrangement. Release and hydrolysis of the rearranged product enable catalytic turnover.

Our design, synthesis, evaluation and use of nanometer scale molecular flasks formed from supramolecular assembly began with a model to explain the supramolecular clusters formed in nature (ferritin and protein viral coats) and applied this model to the synthesis of supramolecular clusters based on labile metal-ligand interactions. A single, discrete product is formed and extra metal or ligand components are excluded. Most of the clusters made are highly negatively charged, however, they have hydrophobic interiors that strongly and selectively encapsulate hydrophobic cationic guests. Because of trigonal propeller chirality at the metal vertices and mechanical linkage between the metal vertices, these clusters are homochiral and resolvable. The cluster, once resolved, can retain its chirality indefinitely!

GDCh-Ortsverband Oldenburg  
Der Vorsitzende

Institut für Reine und Angewandte Chemie  
Der Direktor