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Molecular Recognition Driven Supramolecular Polymer Chemistry

Wednesday March 14th, 1:00pm
Otto Maass, Room 217

This talk will describe examples of supramolecular polymer chemistry. In this first part it will be shown how dendrimers, highly branched polymers with multiple end-groups may be extensively cross-linked using the ring-closing metathesis reaction. The size and rigidity of the resulting nanoparticles can be controlled with a fair degree of precision. The shell cross-linking can serve several purposes. It may chemically protect core functionality (site isolation) or physically entrap molecules inside. Furthermore, an organic template embedded inside the dendrimer may be removed post-cross-linking and the resultant "hollow" macromolecules may retain a molecular memory of the template. This is somewhat analogous to a molecular imprinting process described by Linus Pauling many years ago. Various applications of this chemistry will be discussed. In the second part of the talk recognition units are developed that pair like DNA bases. The units were designed to pair much more strongly than DNA or RNA base pairs and may be useful for a number of applications in nanotechnology. One application that will be discussed in this talk is recognition driven polymer blends - the mixing of polymers that thermodynamically prefer to form two phase. Other applications for stimuli controlled materials will be discussed.

Everyone is welcome
