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347. **MACROMOLECULAR SIGNALLING PROCESSES IN SYNTHETIC BILAYER MEMBRANES.** David A. Tirrell, Department of Polymer Science and Engineering, University of Massachusetts, Amherst, Massachusetts 01003.

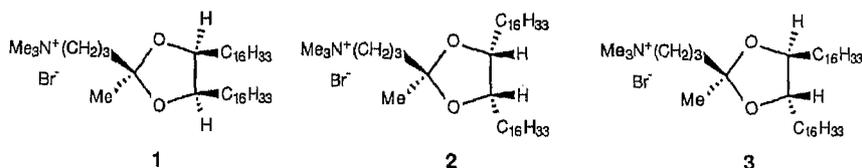
The bilayer membranes that surround cells and subcellular organelles process an array of chemical and physical signals. This lecture will address the design and preparation of synthetic bilayer membranes that behave in analogous fashion. In particular, the use of acidic polyelectrolytes to control surfactant self-assembly has allowed us to prepare membranes that respond to changes in pH, temperature, light intensity, and solute concentrations. The behavior of these membranes is in some ways strikingly similar to that of their natural counterparts. The lecture will describe the results of our most recent investigations of the kinetics, mechanisms and potential applications of macromolecular signalling processes in synthetic bilayer membranes.

348. **CHIRAL TRIPOD AND TEMPLATE SURFACTANTS.** Ned A. Porter, Kwang Kim, Lynn Collins-Gold, and Gregory S. Miracle, Department of Chemistry, Duke University, Durham, NC, 27706.

Micelles and lipid bilayers may have a dramatic influence on the rates and equilibria of reactions of chiral molecules and the nature of molecular interactions in organized media has been the focus of much recent research directed at understanding chiral discrimination in aggregates. We have prepared and studied a series of simple surfactant molecules that have one stereocenter to which is attached four groups with distinctly different surfactant properties. Thus, syntheses of optically pure surfactant molecules having four different hydrophobic, hydrophilic, and acid or base groups attached to one stereocenter have been achieved. The synthesis, resolution, and properties of these new chiral tripods and their potential for use as stereochemical templates will be described.

349. **COMPARISON OF VESICULAR AND MONOLAYER PROPERTIES OF DIASTEREOMERIC SURFACTANTS.** D. A. Jaeger,[†] J. Mohebbian,[†] W. Subotkowski,[†] Y. M. Sayed,[†] B. J. Sanyal,[†] J. Heath,[‡] and E. M. Arnett,[‡] Departments of Chemistry, University of Wyoming, Laramie, WY 82071,[†] and Duke University, Durham, NC 27706[‡].

Diastereomeric surfactants **1**, **2**, and **3** were synthesized in pure form, and their derived vesicles were characterized by dynamic laser light scattering and differential scanning calorimetry. The monolayer properties of the three surfactants were also determined.



350. **POLYMERIZED SUPRAMOLECULAR SYSTEMS. DESIGN, SYNTHESIS, AND CATALYTIC PROPERTIES.** R.J.M. Nolte, Department of Organic Chemistry, University of Nijmegen, The Netherlands.

Biological processes take place with a high degree of sophistication. Many molecules of different types (e.g. enzymes, co-factors, carriers) are involved when a substrate is chemically transformed. Supramolecular structures are used by Nature to keep reaction components together. We are interested in designing synthetic systems that mimic biological reactions. Our strategy is to start from self-organizing assemblies of amphiphilic molecules, e.g. vesicle systems. These vesicles are stabilized by polymerization. In their bilayers and inner aqueous compartments various molecules are anchored or incorporated. These molecules include catalysts, ionophores, electron carriers, and receptor molecules. Anchoring occurs by chemical reaction or by physical absorption. As an example a synthetic model of Cytochrome-P450 will be discussed. This model contains all the features of the natural enzyme system.