CHIMIA 2000, 54, No. 10

EDITORIAL

Supramolecular Chemistry in Switzerland

Supramolecular chemistry, an emerging and rapidly growing research area, is not only attractive from a fundamental point of view but also promising for a variety of applications. In general, supramolecular chemistry means the full understanding of highly organized inorganic, organic, or biological systems at a molecular level. Great advances in the field of molecular synthetic chemistry such as organic chemistry or organometallics have led to a high level of control over molecular interactions. One of the most impressive examples is the development in the field of molecular recognition. Today, the complexation, association and catalysis of organic and organometallic molecules can be fine-tuned almost as precisely as in biological systems. The use of creative combinations of hydrogen bonding, ionic or non-covalent interactions leads to new assemblies such as helicates, grids, host-guest structures, or 'molecular shuttles'. Besides a nearly unlimited molecular architecture, the development of new 'chemical functions' by a combination of simple molecular fragments opens the field of molecular devices. The new function performed by a device results from the interaction of elementary acts performed by the components. Such components can be stimulated by photons, electrons, or ions. Applications of such extended molecular interactions can be found in the areas of catalysis, synthesis of compounds with predetermined chirality, separation techniques, non-linear optics, information storage and transmission, sensors, and microelectronics.

The activities of Swiss scientists in the field of supramolecular chemistry is remarkable. The present issue of CHIMIA presents a selection of ongoing research. We can find contributions that treat the phenomena of energy- and electron-transfer processes in dinuclear metal complexes or DNA, a supramolecular mimic of enzymatic catalysis, the development of artificial ribonucleases, the self-assembled formation of artificial proteins, the supramolecular chemistry of proteins and related molecules, the supramolecular aspects of macrocyclic metal complexes, the molecular-based magnetism in high-spin clusters, the structural principle and properties of helicates, the supramolecular chemistry of chiral pyridine type ligands as well as the preparation and study of switching molecules and photonic devices.

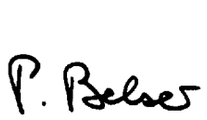
A few years ago a small group of Swiss chemists proposed a new National Research Program devoted to supramolecular chemistry. This initiative, together with highly positive support from international pioneers in this research, prompted the board of the Swiss National Science Foundation to introduce this topic into the 8th series of the National Research Programs. The program 'Supramolecular Functional Materials' was approved by the Secretary of the Interior, Ruth Dreifuss, and was launched January 1st, 1999. 21 projects have been selected by a two-step evaluation process directed by a small international steering committee.

CHIMIA 2000, 54, No. 10

The projects selected to be funded for the first period of three years span a wide spectrum of supramolecular topics. Property-driven synthesis aimed at molecular devices, optical switches, modified biomolecules, and molecular magnets are a few keywords describing the research goals of this program.

It is the dedicated aim of the new program to give a coherent and focussed momentum to the different projects firmly rooted in fundamental research. The emergence of a corporate identity for this group of researchers is expected to produce added value by promoting intense cooperation providing thus a better visibility and by supporting also the dialogue with the industrial and political community. The program and its implementation offer a channel for the transfer of knowledge and of scientific results. It combines basic and oriented research and, most importantly, it emphasizes the potential of supramolecular research for future technologies.

Despite all the impressive effort of designing and building up supramolecular structures, we are only at the very beginning of a fascinating and attractive development, called 'Supramolecular Chemistry'.



Prof. Peter Belser
University of Fribourg

Prof. Andreas Ludi
University of Bern

The Editorial Board of CHIMIA warmly thanks the coordinating guest editor Prof. Dr. Peter Belser of the University of Fribourg for his efforts in the planning and efficient realization of the present issue on 'Supramolecular Chemistry'.