Chemistry's Contributions to Humanity—A Feasibility Study

The objective of this new project, titled "Chemistry's Contributions to Humanity—A Feasibility Study," is to evaluate the feasibility of developing a Web site that chronicles historical innovations in chemistry that have contributed to the improvement of human life. This site could serve as a source of information and education that would enhance interest in and public appreciation of the enormous contributions that chemistry has made over the past 150 years to the betterment of mankind.

Much work has been done in the past and continues today to educate the public about chemistry and its value to society and to bring balanced understanding about the benefits and risks of chemicals. Consistent with its goals, a possible role for IUPAC is to collate and integrate this array of information so that it is a more valuable resource for students, teachers, policy-makers, members of the chemical enterprise, columnists, and the general public. IUPAC can be at the helm of an international effort which will produce an authoritative source of information on the ways in which chemistry and the industries based on the chemical sciences contribute to a better life.

A Web site that portrays major innovations in chemical science over the past century and a half in an interesting and informative format could help in this task. The site would contain an encyclopedia of major chemical accomplishments that have contributed to the betterment of the human condition. It could include a detailed information base of chemical innovations and developments and permit viewing this information through a variety of queries. In short, the Web site would provide a flexible, "living" macro- and micropedia that could grow and develop in sophistication as needs developed and changed.

This is a very ambitious project—one that will take years to complete and require substantial resources. The immediate focus of the current proposal is a comprehensive analysis of the feasibility and potential value of the overall project.

The task group is particularly interested in any published or public Web site information (in English) on the theme of the "value of chemistry to society." Such information will be useful both to include in a bibliography of what is available today and to assess whether IUPAC can add value in providing a comprehensive Web site on this subject. Any person who has information to contribute to the project is urged to contact the task group chairman or any task group members (see project web page below for details).

For more information, contact the Task Group Chairman Ed Przybylowicz <eprzy@rochester.rr.com>.

www.iupac.org/projects/2003/2003-022-1-020.html

The Use of AFM in Direct Surface Force Measurements

The atomic force microscope (AFM), more correctly described as a scanning probe microscope, can trace its origins to the scanning tunneling miscroscope originally invented by Binning and Roehrer. The AFM is aimed at providing high-resolution topographical analysis for both conducting and non-conducting surfaces. The basic imaging principle is rather simple. In a common configuration, a sample attached to a piezoelectric positioner is rastered beneath a sharp tip attached to a sensitive cantilever spring. The alternative arrangement of a moving tip and a fixed sample is also possible. Undulations in the surface of the sample lead to a deflection of the spring, which is monitored optically. The images obtained are critically dependent on the pressure, or force acting or applied, between the tip and the sample. Furthermore, optimal imaging conditions are inevitably sample dependent.

Whilst the AFM is important for imaging investigations, quantifying the tip-sample interaction has become increasingly important in order to improve the quality and reliability of images obtained. However, it was realized in 1991 that the AFM could be used to measure interaction forces directly between a small sphere, attached to the cantilever, and a flat substrate, resting on the piezoelectric positioner, forming an interesting and highly flexible adjunct to the conventional surface forces apparatus (SFA). Force-distance profiles can now be readily obtained for a variety of soft and hard interfaces and the "colloid probe" technique, as it has become widely known, has also been extended to the measurement of friction forces.

The technique is widely used in a large number of research laboratories, in industry, universities, and research institutions. The purpose of this IUPAC project is to produce a timely technical report that recommends experimental procedures for performing