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LAUDATIO

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Wolfgang Ostwald Prize 1995 awarded to Heinz Hoffmann

Prof. Dr. Heinz Hoffmann

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When Prof. Dr. Heinz Hoffmann celebrates his 60th birthday June 23 many of his friends and colleagues will be pleased to offer him their warmest congratulations and best wishes concerning health and happiness. In honor of this occasion and his outstanding contributions to colloid chemistry, Prof. Hoffmann has been awarded the Wolfgang Ostwald Prize of the German "Kolloid-Gesellschaft". Prof. Hoffmann is still very active in many areas of surfactant and colloid science and he is involved in the application and development of many complicated experiments. His fundamental research contributions have been published in more than 215 papers, and he has more such activities planned for the future. His scientific expertise, his advice and views continue to be highly esteemed.

Prof. Hoffmann received many decisive impulses from his scientific career. He was born in June 1935, in Käshofen/Pfalz (Germany). After finishing high school in 1955, he entered the University of Würzburg and started to study chemistry. Two years later, he changed to the "Technische Hochschule Karlsruhe", where he later graduated with a Masters degree in physical chemistry. In 1962, he completed his dissertation under the guidance of Walter Jaenicke. At this time, he worked on special electrochemical reactions which occur on applying a step function electric current. This fundamental research was characterized by experiments which were simple in concept but difficult to execute, and which involved a precise and careful construction of the measuring cells. After completing his thesis, Prof. Hoffmann left to work as a post-doc at Case Western Reserve University in Cleveland/Ohio where he spent 1 year with Prof. E. Yeager. While there, he gained many new ideas for his scientific work. The area in which he acquired a lasting interest focused on the measurements of fast electrochemical relaxation processes with special emphasis on phenomena which occur on the surface of electrodes. It was during this postdoctoral visit in Cleveland that he met and married Claudia, his charming wife.

After returning to Germany, Prof. Hoffmann worked 1 year as research and teaching assistant at the University of Erlangen, and then he returned to the University of Cleveland where he covered new fields of activity. In 1969, he finally returned to the University of Erlangen where he completed his Habilitationsschrift on "kinetic investigations of octahedral nickel complex formations". During this period, he started to build a small laboratory for kinetic investigations and he used such advanced techniques as shock-wave tubes or pressure- and temperature jump experiments in

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order to measure fast kinetic processes. The special equipment for these studies was originally developed by Manfred Eigen in Göttingen, who received the Nobel prize for chemistry in 1967 for detailed investigations of fast kinetic reactions. A few years later, the same type of scientific instruments were specially modified by Prof. Gerhard Platz and Prof. Hoffmann in order to study the kinetic aggregation process of micelles in surfactant solutions. At this time, it was almost known that after disturbing the equilibrium state some surfactant solutions exhibit a very fast relaxation time of the order of a few microseconds, while other experimental results pointed to the existence of a much longer time constant in the range of milliseconds. With extraordinary ability and admirable endeavor Prof. Hoffmann elucidated that two different processes occur in solutions of ionic surfactants after suddenly changing the equilibrium conditions. The fast relaxation time could be attributed to the shift of a micellar distribution curve. This process is mainly governed by the exchange rates of the surfactant molecules which are leaving the micelles and which are entering from the monomeric state. The long relaxation time could be explained on the basis of cooperative processes, which are due to the existence of a limited lifetime of the micellar aggregates. In international collaborations and friendships with Raoul Zana, Gunnar Anianson and S. N. Wall a theoretical model could be obtained which allowed the quantitative description of the dynamic aggregation processes. From this theory it was possible to calculate many interesting properties of the micelles, such as the mean value of the aggregation number, the width of the micellar distribution or the average aggregation numbers of the micellar nuclei. In honor of his difficult and basic experimental work, Prof. Hoffmann was appointed to a full professor position for Physical Chemistry in Bayreuth (1975) where he is still working and teaching today. One year later, he was honored with the "Nernst" award of the "Deutsche Bunsengesellschaft". After such a successful beginning Prof. Hoffmann broadened his scope, covered new fields of activity, and founded one of the major institutes for experimental research in surfacant science.

During the next years, he worked on many different subjects, such as viscoelastic surfactant solutions, vesicles, liquid crystals or ringing gels. As an excellent scientist, he always tried to find a reasonable way of interpreting the experimental data; introducing some simplifications, when necessary, while keeping the essential features. A fairly good example for such an intuitive way of understanding the physical properties of complex colloidal systems is given by some striking features which were first observed in viscoelastic surfactant solutions. Many studies of the rheological properties revealed a monoexponential relaxation behavior at certain concentration regimes and Prof. Hoffmann was the first to suppose that this phenomenon might be due to the limited lifetime of the micellar aggregates. Today, we have detailed knowledge of these molecular processes due to recent theories of M.E. Cates, and there is now general agreement that the original idea of breaking micelles was quite correct.

An extended analysis of this simple example shows the major source of Prof. Hoffmann's success: he can easily combine different results to get an unexpected solution. It is very characteristic for him to use many advanced experimental techniques, in particular electron microscopy, small-angle neutron scattering, rheology, electric birefringence, static and dynamic light scattering, flow birefringence or optical microscopy for experimental investigations of complicated systems. Despite this large amount of information he has the talent to separate the truly interesting components which are of principal importance. In this way he has pioneered many areas of surfactant science and very often he succeeded in forming the key research on which present knowledge has been built. During the last 10 years, he has investigated a large number of different colloidal systems, such as microemulsions, ringing gels, networks, liquid crystals, viscoelastic foams, multilamellar vesicles or iridescent phases. Regarding these topics he helped to clarify the molecular structures and dynamic structures features.

It is impossible to list all the subjects of his scientific work; it is worthwhile to note that he has studied the properties of surfactant solutions in the broadest possible sense. Of particular and long standing interest to him was the investigation of the L_3-sponge phase, where he discovered and confirmed the existence of a multiply connected three-dimensional-network with saddle shaped structure. In all these areas his work is still making a significant impact on surfactant science and the interesting results have lead to many international collaborations and friendships with colleagues in different countries.

In 1984, Prof. Hoffmann was visiting scientist at the Du Pont Company in Wilmington (Delaware) and in 1989, he was invited to spend 2 months at the Tokyo Science University in Japan. During all this time, he was a dedicated member of the Editorial Board of several scientific journals, dealing with surfactant and polymer sciences. For many years he also belonged to the Editorial Board of Colloid and Polymer Science and he is, therefore, well known to all readers of this journal. It is certainly a hallmark of his career that he served as a founding chairman of the European Colloid and Interface Science (ECIS) and for a couple of years he

was selected as the general secretary of this society (1987–1992). Prof. Hoffmann was, hence, not only engaged in scientific work, but he has also carried more than his share of wider administrative duties.

In spite of all these different activities, his friends, colleagues and students are deeply impressed by his kindness, modesty and they know him as a warm and generous person who has somehow acquired the wisdom and knowledge of an emertius professor. We sincerely hope that he will enjoy health and happiness for many years to come. And we look forward to his new activities and interesting contributions to scientific projects.