Meeting Report

Chemical Dynamics at the Turn of the New Century: Nobel Laureates Look Back and Ahead

by J. Van Houten

The symposium "Chemical Dynamics at the Turn of the New Century: Nobel Laureates Look Back and Ahead", commemorating the centenary of the Nobel Prize, was held at the Spring 2001 ACS National Meeting in San Diego. It was sponsored by the Division of Chemical Education and cosponsored by the Division of Physical Chemistry.

During the 20th century the Nobel Prize was awarded 13 times, to 22 recipients, for work involving various aspects of chemical dynamics—beginning with Jacobus van't Hoff, who won the very first Nobel Prize in 1901, and continuing through Ahmed Zewail in 1999. Thus the selection of chemical dynamics as a centenary theme. Of the 22 recipients, 13 are alive today; five accepted the invitation to participate.

My opening of the symposium with a brief historical overview of the Nobel Prizes in chemical dynamics was followed by welcoming remarks from ACS President Attilla Pavlath and Sture Forsen of Lund University in Sweden, who represented the Nobel Foundation. The morning session featured two talks. One, by Manfred Eigen (1967) of the Max Planck Institut für Biophysikalische Chemie in Göttingen, Germany, was titled "What Is Life?" and examined the concept of life in relation to the evolution, transmission, and replication of information. The other was by Yuan Lee (1986) of the Academia Sinica in Nanking, Taiwan, who traced the history and development of molecular beam techniques in which he played such a pivotal role during the last 35 years.

Speaking in the afternoon session, Rudy Marcus (1992), Caltech, described recent investigation of a strange mass-independent isotope effect in the ozone-formation reaction: $O + O_2 \rightarrow O_3$; Sherwood Rowland (1995), University of California Irvine, outlined the history and current understanding of atmospheric chemistry as it is applied to environmental issues—in particular to greenhouse gases and the destruction of stratospheric ozone; and Roald Hoffmann (1981), Cornell University, closed the symposium with a talk dedicated to the memory of the late Kent R. Wilson, which touched on the talks of all the previous speakers.

Photo by Morton Z. Hoffman

Participating in the chemical dynamics symposium were (from left) Manfred Eigen, Yuan Lee, Sherwood Rowland, Rudy Marcus, and Roald Hoffmann.

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Nobel Prizes, Chemical Dynamics

1901: Jacobus Henricus van't Hoff, for his pioneering work on chemical dynamics and osmotic pressure in solutions.

1903: Svante August Arrhenius, in recognition of the extraordinary services he has rendered to the advancement of chemistry by his electrolytic theory of dissociation.

1909: Wilhelm Ostwald, in recognition of his work on catalysis and for his investigations into the fundamental principles governing chemical equilibria and rates of reaction.

1943: George de Hevesy, for his work on the use of isotopes as tracers in the study of chemical processes.

1956: Sir Cyril Norman Hinschelwood and Nikolay Semenov for their researches into the mechanism of chemical reactions.

1967: Manfred Eigen, Ronald Norrish, and George Porter for their studies of extremely fast chemical reactions, effected by disturbing the equilibrium by means of very short pulses of energy.

1981: Kenichi Fukui and Roald Hoffmann for their theories, developed independently, concerning the course of chemical reactions.

1983: Henry Taube, for his work on the mechanisms of electron transfer reactions, especially in metal complexes.

1986: Dudley Herschbach, Yuan Lee, and John Polanyi for their contributions concerning the dynamics of elementary chemical processes.

1992: Rudolph Marcus, for his contributions to the theory of electron transfer reactions in chemical systems.

1995: Paul Crutzen, Mario Molina, and F. Sherwood Rowland for their work in atmospheric chemistry, particularly concerning the formation and decomposition of ozone.

1998: Walter Kohn and John Pople. Kohn: for his development of the density–functional theory; Pople: for his development of computational methods in quantum chemistry.

1999: Ahmed Zewail, for his studies of the transition states of chemical reactions using femtosecond spectroscopy; for showing that it is possible with rapid laser technique to see how atoms in a molecule move during a chemical reaction.