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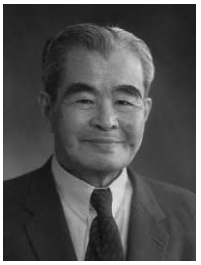
Preface



Professor Juro Horiuti

To celebrate the centennial birthday of the late Professor Juro Horiuti, we started to plan to publish this issue in 2001, as he was born in 1901. He was born in Sapporo, where he spent most of his life as a professor of Hokkaido University and dedicated his active and restless energy to studying catalytic processes as well as electrode processes.

His academic career began as a research associate of the University of Tokyo to develop thermodynamic theory and to observe gas solubilities of which values can be found in the Table of Landolt–Börnstein as well-recognized constants. After being Professor of Himeji Junior College and Research Fellow of Chemical and Physical Research Institute (presently called as Riken), he studied physical chemistry, especially quantum chemistry, in Göttingen University in 1932–1933. When he stayed in Göttingen, he was acquainted with E. Teller with whom he lived in the same apartment house. He enjoyed a hot discussion not only with Teller but also with W. Heitler, L.W. Nordheim, E.P.Wigner, and G. Herzberg, since Göttingen University was a world center of physics and physical chemistry at that time. Meanwhile, he often visited M. Polanyi at the Kaizer Wilheim Research Institute in Berlin for discussion.

When Polanyi moved from Berlin to Manchester, England in 1933, he decided to study catalysis in Polanyi's laboratory at Manchester. His later academic career was directed by the work with Polanyi. Horiuti and Polanyi employed deuterium, which had been just discovered by H. Urey in 1931, for the determination of the reaction processes. Their results on hydrogen–deuterium exchange reactions were reported in *Nature* as several letters in 1934. Their concepts on reaction kinetics appeared in *Acta Physicochimica USSR* (1935) in German; an English translation is taken to be included in the present issue.

In February 1935, he came back to Sapporo as a professor of physical chemistry laboratory, Hokkaido University, and kept the position until 1965 when he retired at the age of 63 due to the university regulation. Meanwhile, he was awarded the Prize of Japanese Academy of Sciences (Onshi-sho) for theoretical and experimental development of chemical reactions, then founded the Research Institute for Catalysis in Hokkaido University, became Director of the Institute, and held the position until his retirement. After his retirement from the University, he again returned to Hokkaido University as President from 1967 to 1971, when the student riot swept all over Japan.

For academic societies, he served as the President of Catalysis Society of Japan, and Chairperson of IUPAC section of heterogeneous reaction, member of editorial boards of the *Journal of Catalysis*, *Z. Phys. Chem.*, and *Advances in Catalysis*. He was elected as a member of the Academy of Sciences of Germany in 1965.

In Hokkaido University, he developed the general theory of chemical reaction and heterogeneous reaction based on statistical thermodynamics; his paper appeared in the *Journal of the Research Institute of Catalysis*, Hokkaido University has been reprinted in this issue. His analysis of reaction mechanism introduced the concept of "stoichiometric number" of the rate-determining step. The concept was later generalized to the elementary steps of the reaction.

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He published more than 200 papers including papers in Japanese, a textbook of catalysis, and several monographs.

He tried to write a textbook of chemical thermodynamics, but died at the age of 77 in 1978, leaving a manuscript nearly completed, which was published as a textbook (in Japanese) in 1981.

He also wrote many essays on the education in the sciences and on how the scientist should contribute to society. He advocated the importance of an experimental training, telling us that if you learn how to practice judo in the classroom only, you cannot be a judoist ever. He always advised us to build up our own philosophy on the basis of the study of science.

He enjoyed rowing as a hobby in his life, and once coached the Hokkaido University crew according to his new theoretical calculation for rowing, leading to the 1954 Japanese championship and also the victory over the Cambridge University crew in Tokyo.

Publication of the present issue memorial to Professor Juro Horiuti was launched by the committee of the editorial board of *Journal of Molecular Catalysis* in 2001, when Professor M. Boudart was one of the board members. The editors deeply appreciate the contributors to this special issue. Editor

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