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## 37. Masao Horio 1905-1996

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## Personalities in Polymer Science

Obituary

Masao HORIO  
1905–1996



Professor Masao Horio, one of the founders of polymer science in Japan died on December 21, 1996 in Kyoto, Japan. Few persons have made as great an impact on science in Kyoto and on science in Japan. Together with Ichiro Sakurada, Horio created polymer science as a separate discipline of science in Kyoto and in Japan.

Masao Horio was born on July 20, 1905, Osaka, Japan. He attended Inamiya Middle School in Osaka and then he went to Osaka College which was called Osaka High School at that time.

In 1925, Masao Horio enrolled in Kyoto University, Department of Industrial Chemistry, Faculty of Engineering, completed his studies there and graduated in 1928. In 1934, he received his doctoral degree in Engineering under the guidance of Professor Buzo Fukushima. He then went into industry and, from 1935 to 1938, he served as Research Director of the Kurashiki Rayon Company.

Masao Horio's academic career started in 1938, when he was appointed Assistant Professor at the Faculty of Engineering, Kyoto University. In 1941 he was appointed Professor and became chairman of the newly formed Department of Textile Chemistry, a position he held until

1960. In 1961, this department was renamed Department of Polymer Chemistry. In 1969, at the obligatory retirement age of Kyoto University, Professor Horio retired and became Professor Emeritus.

During his active life at Kyoto University, Masao Horio held a number of key positions: From 1953–1956 he was the Head of the Institute for Chemical Research, Kyoto University; from 1957–1959 he functioned as the Dean of the Faculty of Engineering, Kyoto University and from 1960 to 1966 he held the position of Head of the Engineering Research Institute, Kyoto University.

Horio always maintained that basic research is of great importance in the pursuit of applied science, and he encouraged young scientists to make their individual contributions. When he became Professor, he followed the investigations on man-made fibers, on wood chemistry and the work of Professor Gen-itsu Kita. Professor Kita, at that time, belonged to the Department of Industrial Chemistry and had founded the Department of Fuel Chemistry and the Department of Textile Chemistry. Kita also created the Kyoto School of Industrial Chemistry, which produced such eminent personalities as Shinjio Kodama, Ichiro Sakurada, Ken-ichi Fukui (Nobel prize winner 1981) and Junji Furukawa.

When the Department of Textile Chemistry was founded in 1941, Horio in collaboration with Ichiro Sakurada, K. Fujino and Seizo Okamura, as the most important professors of the Department, made great efforts to establish this new University Department as the leading research center of polymer chemistry in the world.

Masao Horio made innumerable outstanding contributions to research areas in both textile chemistry and polymer chemistry producing many younger polymer scientists. He also rendered important services to the administration of Kyoto University, to the educational policy of the Ministry of Education, Science and Culture in Japan, the administration of scientific researches in Japan, and to international exchange.

During his active professional life Masao Horio was elected and appointed to many National organizations and committees related to education and research; he was a member of the

University Chartering Council in the Ministry of Education, Science and Culture, a member of the Council of National Research Institutes affiliated with Universities, a member of the Engineering School Commission in the Ministry of Education, Science and Culture, a member of the Central Education Council in the Ministry of Education, Science and Culture and a member of the Science and Technology Council in Japan and, last but not least, he was elected a member of the prestigious Science Council of Japan from 1957 to 1965. He also served as the director of the Research Institute for Chemical Fibers, Japan.

Masao Horio was also active in professional societies in Japan. He was the Chairman of Division of Rheology, the Society of Materials Science, Japan from 1959 to 1961. From 1961 to 1968 he was Vice-President of the Society of Materials Science, Japan and in 1968, he was elected President. In 1968, Horio was Co-Chairman of the 5th International Congress on Rheology, from 1968 to 1972, he was the Chairman of the International Committee of Rheology, in 1973, Horio was President of the Chemical Society of Japan, and, from 1973 to 1975, he was the President of the Society of Rheology, Japan.

Because of his extensive scientific and professional involvement significant recognition came early to Masao Horio. In 1970, he received the Purple Ribbon Medal, in 1975, the 2nd Order of the Sacred Treasure and in 1993 the Award for Persons of Cultural Merits of Japan.

Horio's studies can be divided into 7 areas: 1) Stretch spinning process with two-baths for viscose rayon fiber production. In 1939 he invented the stretch spinning process. 2) Wood chemistry and the production process of chemical pulp using the sulfite process (Kraft process) instead of sulfite process. He also studied hemicellulose (xylan) and lignin extracted from woods, and a possible polyester formation from vanillin, as well as photodegradation of cellulose by UV light. 3) Bilateral structure in wool fiber and the production process of crimped man-made fibers. 4) Fine structure and deformation mechanism of natural and man-made fibers. 5) Studies of dielectrics. 6) Rheological properties of polymers with S. Onogi.

## Columns

7) Photochemical reactions of diazo compounds and a theoretical study of the absorption spectra of organic compounds.

The work of Masao Horio is published in ca. 100 scientific articles, and several reviews and books. Horio also held 15 patents. Today this kind of record might not be outstanding, but Professor Horio believed that his name should not be placed on papers that were primarily his students. Scientists that achieved later status of high distinctions, like, Onogi, Inagaki, Nishijima and Kobayashi were encouraged to publish on their own, without Horio's name on their papers. Only those papers where Horio was truly the exclusive contributor did he have his name on the paper.

Horio was not only active in academic, professional and National affairs, he was also involved in consultations with industry. Most famous was his life long association with UBE Industries. He was highly regarded and admired as a consultant and friend to generations of scientists and administrators at UBE Industries.

In addition to his enthusiasm for science, Masao Horio was an active rugby player in his youth, and he served as the head of the rugby team for many years even when he was a Professor at Kyoto University.

In 1934 Masao Horio married Kazu Masutani. They had 5 children, 2 boys and 3 girls, and 10 grandchildren.

Masao Horio was a personality of exceptional dimensions. His death is now mourned by the scientific community of Japan and the world.

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