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## 21. Teiji Tsuruta

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## Personalities in Polymer Science



Teiji Tsuruta

### Honoring Professor Teiji Tsuruta on his 80th Birthday

We are honoring Teiji Tsuruta on his 80th birthday. He was and is an **inspiring leader**, an **outstanding scientist** and a **highly respected person**. Some of his scientific and personal contributions have been summarized in *Polymor News*, 1995 Vol 20, Pp 274–275.

Teiji Tsuruta was born in Kotohira, Kagawa-ken (Prefecture), Japan as the son of Junzo and Yasu Tsuruta on January 1, 1920. Teiji grew up in Kagawa-ken until he entered the Sixth High School in Okayama. Kagawa-ken was a part of Japan where Buddhism had been very popular; it originated from the teaching of a great Buddhist priest, Kuukai (774–835 A.C.) whose birth place is located at Zentsuji, Kagawa-ken a town near Kotohira. During his childhood, Tsuruta saw frequently Buddhist pilgrims in humble white clothes; the local people received them very kindly, which gave young Teiji a sincere and religious mind.

Teiji Tsuruta attended the Sixth High School (Okayama) which corresponded to a junior college in the old Japanese education system, emphasizing a "liberal arts education". In this school, Tsuruta was strongly influenced by Professor Nozomu Yamaoka who used to visit the Judo-Gym in late afternoons to encourage students, including Tsuruta, to persevere in the hard training of Judo. In the meantime, Yamaoka became his che-

mistry teacher in his 3<sup>rd</sup> year and inspired Teiji, to make chemistry his profession, which he did. Tsuruta admired his idol Yamaoka all his life.

Teiji Tsuruta graduated from High School in 1939, enrolled at Kyoto Imperial University and studied in the Department of Industrial Chemistry, from where he graduated in 1941. His Bachelor's thesis (Sotsuron) was supervised by Professor Ryohei Oda.

The same year Teiji Tsuruta was appointed a Junior Research Associate (Fuku-shu) at the Oda Laboratory of the Institute of Chemical Research (ICR) in Kyoto. During this time he published his first original paper "New Synthesis of Dibenzyl in Aqueous Media (in Japanese)" (1942), and his first review article on "Chloroalkylation" (in Japanese).

In 1945 Tsuruta returned to Kyoto Imperial University (later Kyoto University) as Junior Research Associate (Fuku-shu) and, in 1949, he became an Instructor (Jo-Shu) at the Faculty of Engineering. In 1951, he was appointed Associate Professor (Jo-Kyoju) of the Oda laboratory at ICR but he joined formally the research group of the newly appointed Professor (Kyoju) Junji Furukawa.

During this time he pursued his studies toward his doctoral degree and became Doctor of Engineering in 1953. His thesis advisor was Professor Ryohei Oda and the title of his thesis was "Studies of Organic Reaction Mechanism with Active Methylene Compounds". A major part of the thesis was concerned with Michael Reactions, through which Tsuruta became interested in the nucleophilic reactivity of double bonds.

In 1956 Teiji Tsuruta moved to the Faculty of Engineering at Kyoto University and began the study of anionic polymerization and organometallics-initiated polymerizations. Tsuruta remained a senior coworker and group leader in the Furukawa laboratory until 1962. Dr Tsuruta has always admired both Professors Oda and Furukawa and was grateful for what he had learned from both of them.

In 1959, when he was 39 years old, Tsuruta wrote his first book "Synthetic Reactions for Macromolecules (in Japanese)", which gained a great deal of attention in academia as well as industry. The book is still sold after many revisions and it is in its 24th edition in 1999. It was translated into Russian and Chinese.

Tsuruta published also another book "Macromolecular Design". Also, in 1961, Tsuruta published a scheme on the "Systematic Overview on Reactivities of Monomers and Initiators in Anionic Polymerizations" which received a great deal of attention and was cited frequently.

In 1962, Teiji Tsuruta was appointed Professor (Kyoju) at the faculty of Engineering of Kyoto University at the Department of Synthetic Chemistry.

In October 1964 Teiji Tsuruta received and accepted a call to the Chair of Professor of Engineering at the University of Tokyo. During this time Tsuruta worked on well-defined organo-zinc complexes for epoxide polymerization, which are now commonly referred to as *Tsuruta Catalysts*.

He remained Professor at the University of Tokyo until his retirement in 1980.

In April of 1980, Professor Tsuruta moved to the Science University of Tokyo (SUT) as Professor of Engineering and, later, became the Dean of Engineering at SUT. In 1985 Professor Tsuruta accepted an appointment as Director of the Research Institutes for Science and Technology of SUT. He was also instrumental in founding the Research Institute for Biosciences of SUT and served as its director from 1989–1994. In January 1995, Teiji Tsuruta returned to the School of Engineering of SUT and finally retired from SUT in March 1996.

He served as a guest professor at the materials science division of the Japan Advanced Institute of Science and Technology (JAIST) located near Kanazawa from April 1996 to March 1999.

During his professorships at the three universities with which he was associated, Tsuruta was the thesis advisor of 45 Ph.D. students, one half of them are now University Professors, while the other half are working or have worked in industry.

Professor Tsuruta was a prolific writer and published nearly 300 scientific papers from 1942–1995.

Teiji Tsuruta has been very active in the publication of scientific Journals. In Japan, he was Editor-in-Chief of the Journals: *High Polymer*, *Journal of the Chemical Society of Japan*, *Collected Papers in High Polymers and Polymer Journal*; he was also the Regional Editor of *Die Makromolekulare Chemie* and of *Reactive Polymers*. He also served on the Editorial Board of several other Journals. Since 1989, Teiji Tsuruta has been

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serving as one of the founding Editors of the Journal of Biomaterials Science Polymer Edition.

In his professional activities Teiji Tsuruta achieved high ranks in a number of Japanese Societies. He was the President of the Society of Polymer Science, Japan from 1980 to 1982 and of the Chemical Society of Japan in 1985. He is now an honorary life member of the two Societies, since 1985 from SPSJ and since 1990 from the Chemical Society of Japan. The Japanese Society of Biomaterials also bestowed on him an honorary membership. Tsuruta joined ACS in 1962 and he is now an Emeritus Member.

In 1988, he organized the Third World Biomaterials Congress in Kyoto, which was a great and successful congress. In 1993, Tsuruta edited a book "Biomedical Applications of Polymeric Materials" (CRC Press). In 1995, a symposium entitled International Conference on "Advanced Biomaterials in Medical Engineering and Drug Delivery Systems" was held honoring Professor Teiji Tsuruta on his 75th Birthday. In 1996, Tsuruta was awarded the "Fellowship of Biomaterials Science and Engineering" from the International Liaison of Societies for Biomaterials, in recognition of his outstanding contributions to the field of Biomaterials.

Other honors awarded Teiji Tsuruta are: the G. Stafford Whitby Award, the Award of the Chemical Society of Japan, the Award for Society of Biomaterials. He also received an honorary doctoral degree (doctor honoris causa) from the University Pierre and Marie Curie (Paris).

Numerous were Tsuruta's activities as Plenary and Invited Main Lecturer in International Symposia. Teiji Tsuruta has also acted as Chairman of several National and International Committees on Polymers and Biomaterials and as Chairman and Co-Chairman of International and Bilateral Symposia, Conferences and Seminars.

From 1995 to 1998 Tsuruta was the Chairman of the Committee for Japanese history of polymer science and technology which was sponsored by the Society of Polymer Science, Japan (SPSJ). In 1998, SPSJ published a 198-page book "Japanese History of Polymer Science and Technology". In this book are described the personal histories of 24 leading scientists who made outstanding contributions to polymer science and technology

in Japan. The history of the various branches of polymer science and technology in Japan are also described and compared with those of overseas countries.

Teiji Tsuruta has a number of hobbies and interests, related to sport and culture. He is the holder of the black belt, of the second rank for his achievements in Judo. He treasures very much his achievements in Judo tournaments in which he was very active in 1938.

He is also interested in *Kabuki* and *Ragugo*, a classical Japanese comic story and likes to listen to European music particularly Mozart.

Since 1946, Teiji Tsuruta has been married to the former Sachiko Fukuda, who was born in Tokyo in 1925. They have one daughter, Kumiko. She majored in English literature at Seikei University. She taught in several high schools and is now a lecturer at the International Student Institute of Tokyo. Her husband, Kaoru Hasegawa works for the Sony Corporation.

On his 80th anniversary, I wish Teiji Tsuruta and his family the very best for a long life, good health and continued happiness. **Otto Vogl**, Herman F. Mark Professor Emeritus, University of Massachusetts, Amherst, MA, 01003-4350.