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## 22. Yu Tongyin

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## Personalities in Polymer Science



YU Tongyin

### Honoring Professor Yu Tongyin on his 80th Birthday

Yu Tongyin is one of the leading personalities of polymer science and engineering in China. He is not only a very outstanding scientist but also an excellent teacher and organizer. His broad interests include the synthesis and characterization of polymers, polymer blends, the morphology of polymers and the technology of polymer fabrication.

Yu Tongyin was born in Wuxi, Jiangsu, China on August 6, 1917. In 1923 he entered the Wuxi Elementary School and later moved to the Suzhou Middle School from where he graduated. In 1934 he enrolled in the University of Zhejiang and received his Bachelor's Degree in Science from this University in 1938. Subsequently he joined the Institute of Materials Testing in Kunming as a technician and worked there until 1941. In 1942 he joined the Kunming Chemical Company as an engineer and worked there until 1944.

Yu Tongyin began his academic career in 1944 when he was appointed as an instructor at Zhejiang University, a position he held until 1947.

In 1947 Yu Tongyin decided to obtain a higher academic degree. He chose to

study at the University of Michigan in the USA for a PhD degree which he obtained in 1950 under the direction of Professor P.A.S. Smith. He stayed for another year in Ann Arbor as a Research Associate.

After returning to China in 1951, he accepted the appointment of Professor at Zhejiang University. Soon thereafter, in 1952, a new position, Director of the Division of Organic Chemistry, was created at Fudan University in Shanghai. This position was then offered to Yu Tongyin, who accepted this offer and has been at Fudan University since that time. In 1958 he organized the Institute of Polymer Chemistry at Fudan University. In 1982 he became the first Director of the Institute of Material Science and served in this position until 1988. When he retired in 1992, he was elected the Honorary Director of the newly founded Institute of Macromolecular Science at Fudan University. In all these institutions, his scientific career focussed on chemistry and physics of macromolecules.

After Yu Tongyin returned from the United States and went to Fudan University at Shanghai, he spent much of his time organizing the laboratory. In this period he surrounded himself with young, ambitious scientists and lecturers, encouraging them to pursue their own individual scientific careers to the best of their ability. At the same time new chemistry textbooks were needed and Yu created new Chinese versions of textbooks and other teaching materials. New courses in organic chemistry were developed in the Department of Chemistry at Fudan University.

In 1958, Professor Yu started to organize the Institute of Polymer Chemistry at Fudan University, including the creation of courses in Macromolecular Science. Yu made a clear distinction between organic and macromolecular chemistry and made clear that polymer science was not merely a subdiscipline of organic chemistry.

In his Institutes, Yu Tongyin started his own research work initially in the field of organo-silicon chemistry. Yu subsequently developed programs in polymer synthesis, physico-chemistry, physics and technology of polymers. He emphasized both research and training of the younger

generation of scientists and teachers and played particular attention to send the most promising young scientists to study abroad and to develop cooperative research programs. Some of these scientists have become well known and represent polymer science in China worldwide.

The Institute of Macromolecular Science at Fudan University has become one of the most prominent Centers of polymer research in China.

In his responsibility of directing a leading Institute of Polymer Science, Yu Tongyin's research was directed toward the necessity of covering several areas of polymer chemistry and physics: silicon polymers, polymer solutions, photochemical reactions on polymers, kinetics of polycondensation, polymer viscoelasticity, structure and morphology of crystalline polymers, miscibility and multicomponent polymer systems.

In 1987 Professor Yu Tongyin left his position of Director of the Institute of Material Science at the age of 71. He started a new research project in the area of silk fibroin, an ancient fibrous protein which is of considerable general interest. He and his group found that the silk protein obtained from the silk gland of the silk worm has liquid crystalline behavior and that the formation of silk fibroin fiber is a physical denaturation process. The technique could also be applied for the immobilization of enzymes.

Various synthetic analogues of silk fibroin, homo- and copolymers of amino acids with molecular weights comparable with that of natural silk fibroin were prepared and studied.

Yu Tongyin's work and research accomplishments have been published in about 180 contributions (of which there are about 170 papers, 6 books and 2 patents).

He was and is on the Editorial Board of a number of professional polymer oriented Journals: *Acta Polymerica Sinica*, *Acta Chimica Sinica*, *Chemical Journal of Chinese Universities*, *Chemical Research in Chinese Universities*, *Progress in Polymer Science*, and *Polymeric Materials Science and Engineering*. He also served as the Editor of the Chinese Journal—*Chemical World*.

\*In this article we are following the Chinese custom and use the family name first; for the use of oriental names see also Dong Van Luyen, Dang Mai-Huong and Otto Vogl, *Polymer News*, 20(12), 398 (1995).

## Columns

Yu Tongyin received a number of prestigious awards. He was honored with three Scientific and Technical Advancement Prizes of the National Education Committee of China in 1988, 1989 and 1990, and was elected a life member of the Chinese Chemical Society. He was a councilor of the Committee of Polymer Chemistry of the Chinese Chemical Society from 1983 to 1991, and the Chairman of the Committee of Polymer Chemistry of the Shanghai Society of Chemistry and Chemical Engineering during the same period.

During his teaching period at Fudan University Yu Tongyin was the advisor of 23 Ph.D candidates beginning in 1981, the year that China began the modern Ph.D program system. Most of his former students are now Professors at various universities in China. From 1992 to 1995 Yu was a Guest Professor at the Department of Materials Engineering of the China Textile University.

In addition to his many contributions to science and education in China and Fudan University, Yu Tongyin has continued his intense interest in classical music and in Chinese and world history.

In 1950 Yu Tongyin married the former Sylvia Tsai of Xiyou, Fujian, who was the last doctoral student of Professor H. H. Willard at the University of Michigan and who also became a Professor at Fudan University. They had two daughters, Min and May. Yu remarried in 1973, Qingjuan Xu of Ningbo, Zhejiang.

This article was prepared by **Otto Vogl\***, Kyoto Institute of Technology, Matsugasaki, Sakyo-ku, Kyoto 606, Japan, and **Fu Shukuan**, Department of Macromolecular Science, Fudan University, Shanghai 200433, China.