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## 13. Josef Schurz

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## Personalities in Polymer Science



Josef Schurz

### Honoring Professor Josef Schurz on his 75th Birthday

Josef Schurz is one of the **leading scientists in polymer science** in Europe. He has contributed significantly to the characterization and identification of the structure and behavior of **cellulose**, a material of enormous importance in our lives. He has also contributed and, in part, revolutionized the **physicochemistry and solution characterization** of high polymers.

Josef Schurz was born on December 23, 1924 in Zeltweg, in the province of Styria, Austria, as the son of Rosa and Josef Schurz. He grew up in Zeltweg which is a small industrial town in the Mur valley of Styria, surrounded by high mountains. This surrounding shaped his lifelong love for mountains, mountain climbing and skiing. Josef, or, as he is fondly called, "Sepp", by his friends, went to Elementary School in Zeltweg, to Middle School in Knittelfeld and to High School in Pettau; he graduated in 1943.

In 1945 Josef Schurz enrolled at the University of Graz and studied Chemistry and Pharmacy. He received his Ph.D. in 1951 at the Institute of Physical Chemistry under the direction of Otto Kratky with a thesis entitled "Automatization of Quantitative Photometric Measurements of Small Angle X-Ray Pictures". As was required at that time for his Ph.D. degree,

Schurz also studied philosophy and psychology. He became very interested in these subjects and this interest has continued during the rest of his life.

After receiving his Ph.D., Schurz decided to go abroad and study new and exciting developments in science. He contacted Herman Mark who had been teaching physicochemistry, with emphasis on polymer chemistry, at the University of Vienna before the Second World War, and who was then the Head of the Polymer Research Institute at the Polytechnic Institute in Brooklyn, NY. Sepp Schurz became a Research Fellow, returned home from abroad in 1952, and joined the United "Glanzstoff" Company in Oberbruch, Germany.

In 1954, Schurz returned to the University of Graz as an Assistant to Professor Kratky; he was appointed lecturer in 1958 and became the Head of the Division of Physical Chemistry of High Polymers at the Institute. In 1966 he was appointed Associate Professor.

In 1969 Sepp Schurz was offered and accepted the position of Professor of Macromolecular Chemistry at the Technical University Darmstadt, Germany. He became the Director of the Institute of Macromolecular Chemistry at the Technical University in Darmstadt. In 1970, Schurz was also appointed Honorary Professor at the University of Graz.

In 1974 Josef Schurz was invited and accepted the position of Full Professor of Physical Chemistry at the University of Graz and Head of the Institute of Physical Chemistry. In 1983 Josef Schurz retired as Professor Emeritus of the University of Graz.

During his academic career Schurz filled several administrative positions. He was Dean of Chemistry at the Technical University Darmstadt in 1971/72, Chairman of the Committee of the Group Chemistry of the University of Graz in 1974/1975 and the Dean of Natural Science of the University of Graz in 1977/78.

Josef Schurz was and is highly regarded worldwide as a scientist and as a lecturer. He has visited Scandinavia, Israel, the U.S.A. several times, East and West Germany, Japan, Poland, the USSR and India. He has lectured in Austria, Germany, France, Italy, Czechoslovakia, Hungary, Romania, Sweden, Finland, England, Poland, USSR, Yugoslavia, Israel, USA, Canada, Japan and India. Schurz was

Guest Professor in the USSR (Leningrad, Moscow) (1968), and in Lodz (Poland) (1973).

For his scientific accomplishments and his academic and professional activities Josef Schurz has been recognized by many awards: The Felix Kuschenitz Medal of the Austrian Academy of Sciences (1963), The Theodor Körner Prize (1963), the Wilhelm Bölsche Medal (1964), the Dr. Karl Kellner Insignia of Honor (1975), the Austrian State Prize for Rheuma Research (1979), the Dr. Edmund Thiele Honorary Coin (1981), the Erwin Schrödinger Prize of the Austrian Academy of Sciences, the Medal of the University of Gent (Belgium) (1984), the Golden Pin of the Association "Zellcheming" (1986), the Golden Medal of the Technical University of Bratislava (CSSR) (1987), the Herman F. Mark Medal (1987) and the J. H. van't Hoff Medal (1989).

In addition, Josef Schurz received the Cross of Honor, I. Class for Arts and Science of Austria (1983), the Distinguished Service Award of the Austrian Universities (1985), the Golden Pin of Honor of Kosmos (1988) and the Golden Insignia of Honor of the State Styria, Austria (1990).

Schurz has been a Member of the Austrian Academy of Sciences since 1991, he has been a corresponding Member since 1983. He is a Member of the International Academy of Wood Science and of the New York Academy of Sciences.

In 1993 Josef Schurz received an honorary doctoral degree from the Technical University of Iasi (Romania).

Josef Schurz is a member of the Society of Sigma Xi, the Austrian Chemical Society, The German Chemical Society, the Colloid Society, the German Bunsen Society, the Association of Cellulose and Paper Chemists, the Association of Academic Paper Engineers, the German Rheological Society, the International Society of Biorheology, the American Chemical Society and the American Association for the Advancement of Science.

From 1959 to 1969 Josef Schurz was the Chairman of the Section Macromolecular Chemistry of the Austrian Chemical Society and the Founder of its Division of Rheology. From 1960 to 1969 he was the Representative of Austria in IUPAC. From 1969 to 1974, he was the Director of the Archives of Zellcheming; from 1969 to 1975, the Member of the Executive Committee of the Association of

## Columns

Cellulose and Paper Chemists and Engineers. Since 1968 Schurz has been the organizer and chairman of the Round Table discussions on Cellulose of Zellcheming. From 1969 to 1975, he was a Member of the Committee for Macromolecules, Mainz-Darmstadt of the German Research Association. From 1960 to 1993, he was the Austrian Representative in the International Committee on Rheology. He was also the Founder of the Austrian Society of Rheology in 1974 and its Chairman for many years. He was also a Member of the Board of the Austrian Chemical Society.

In 1975 Josef Schurz founded the Laboratory for Colloid Research in the Research Society of Joanneum Ges.m.b.H Graz and was, until 1993, its Director. Since 1974, he was a Member of the Executive Committee of "Urania in Steiermark", a Society that is involved in the concern of the well-being and education of the citizens of the state of Styria (Steiermark), Austria. Since 1950, he has been a member of the Board of the Academic Section Graz of the Austrian Alpine organization.

Josef Schurz's work centers around the understanding and characterization of high polymers in solution: rheology, scattering of light and x-rays, and electrokinetic measurements. He proved the existence of a gel fraction even in dilute solutions and studied the transition particle-network-solution, which allowed the direct determination of the statistical chain element. In his studies on concentrated solutions of the entanglement type he discovered several empirical scaling laws connecting rheological parameters with molecular characteristics, including the molecular weight distribution. He also added electrokinetic measurements (zeta-potential) to his experimental repertoire, which consisted, in addition to rheology, of light scattering of x-rays, both wide angle and small angle diffraction.

His activity in the field of rheology was highlighted by the organization and direction of the First Conference of European Rheologists in Graz in 1982, which led to the foundation of the European Rheological Society with regular meetings.

He studied the biomaterial synovial fluid which led to a rheological explanation of joint arthroses. The fine structure of solid polymers was elucidated, whereby the study of inner surface and void system was stressed. On the other hand, the study of surface zeta-potential, together with

other methods, allowed a concise characterization of fibers and films.

Josef Schurz published almost 400 scientific papers, contributed 6 book chapters, wrote or edited 12 books and has 8 patents to his credit. Schurz was or is on the Editorial Board of 8 prestigious polymer related Journals.

As an scientist of world rank, Josef Schurz was cited in almost every biographic compilation of the highest reputation, including "Who is Who in the World"; in some cases, several times.

Even more important is the fact that about 200 students obtained their diploma or doctoral degrees under his guidance. Today they are active all over the world as research chemists, managers, industrialists and University Professors. Apart of all these activities, Sepp Schurz has always been concerned with the popularization of science and published about 200 articles in various magazines.

Schurz has also written a number of papers in philosophical, psychological and epistemological journals. He has always tried to transcend the narrow borders of his special scientific field, and to search for the common and the universal in science, culture and society.

Sepp Schurz was always close to nature. He was and is an active mountaineer and skier, he likes flowers, collects minerals and has deep attachment to his native country, which is documented by the publication of a "Naturalist's Guide through Styria", which appeared in 1982.

In 1955, Josef Schurz married Grete Koller, who works as a free lance journalist. They have two sons and 3 grandchildren. Both he, his wife and also his two sons, are active in psychology and philosophy.

This article was prepared by **Otto Vogl**, Department of Polymer Science and Engineering, University of Massachusetts, Amherst, MA, 01003, USA and **Grete Koller-Schurz**, Mariatroster Strasse 172f, Graz, Austria.