

# IN MEMORIAM

Prof. dr hab. inż.

**Roman Pampuch**

*Doctor Honoris Causa*

4 March 1932 – 13 February 2017

In February 2017, has gone forever Professor Roman Pampuch, a professor of AGH University of Science and Technology in Kraków and *Doctor Honoris Causa* of AGH. He was a scientist, who made an outstanding contribution into creating and developing the world materials science and materials engineering, particularly in the scope of ceramic materials and processes.

Prof. R. Pampuch was born on 4 March 1927 in Bydgoszcz. Between 1945 and 1948, he studied at the Faculty of Chemistry of the Silesian University of Technology. After the studies, he undertook a job in the Main Institute of Mining (GIG) in Katowice, where he conducted research on the processes of pyrolysis and hydrogenation of carbon. He gained a doctorate in this scope, and defended it at Wrocław University of Science and Technology in 1954. In 1955, he undertook a job in the Institute of Refractories in Gliwice, focusing his further scientific activity on ceramics. In 1962, he started working at the Faculty of Ceramics of AGH, organised in 1949 by the outstanding scientist Prof. Adam Bielański, and he remained faithful to AGH and the Faculty till the rest of his life. He was habilitated in 1963 at the Faculty of Metallurgy of AGH; in 1969, he was conferred the title of associate professor, and in 1976, the title of full professor. In 1983, he was appointed a correspondent member, and in 1993, an ordinary member of the Polish Academy of Sciences (PAN), and in the same year, an member of the Polish Academy of Art and Sciences (PAU).

Prof. Pampuch performed many functions at AGH University of Science and Technology. He was, among others, the Head of the Laboratory of Physical Chemistry of Silicates of the Department of Chemistry of Silicates (1962–1967), Director of the Institute of Advanced Ceramics and Refractories (1969–1973), Head of the Department of Materials Science and



Special Ceramics (1967–2000), Deputy Dean of the Faculty of Materials Science and Ceramics (1964–1968) and Dean of the Faculty from 1969 to 1972.

Prof. R. Pampuch's fundamental scientific activity coincided with the period when the modern science of ceramic processes was created, in which made a serious contribution. His first works concerned crystal chemistry of silicates and phase changes in silicates, particularly the processes of thermal decomposition and determining the nature of amorphous change phases in the processes of aluminosilicate decomposition. Then, Prof. Pampuch focused his scientific work on the process, which is fundamental to ceramics, i.e. sintering. He managed to form and confirm experimentally for the first time the role of reorganising grains at the first stage of sintering, and identify the role of internal stress at the stage of grain consolidation and growth in this process. He also developed the theory of sintering materials with covalent bonds.

All this research contributed significantly into the development of solid state chemistry. At that time, the book entitled *Solid state chemistry* was created by J. Dereń, J. Haber and R. Pampuch, which still remains a basic and up-to-date textbook in this field. Just as the series of original books on the structure and properties of ceramic materials and obtaining them, published in Poland and abroad by the Elsevier publishing house, which became the basic literature all over the world, and gained popularity similar to the W. O. Kingery's leading textbook on ceramics.

The knowledge and research experience gained by Prof. R. Pampuch allowed him in the seventies to get involved in the development of interdisciplinary scientific fields, which were new around the world, i.e. materials science and materials engineering based on it. Already in 1964, Prof. Pampuch started

lectures in the subject of Materials Science. Those were the first steps to create the major of materials science at AGH. After that, teaching and research at the Faculty of Ceramics of AGH University were restructured in the spirit of materials engineering, and Prof. Pampuch was joined in his work by, among others, Prof. E. Goerlich and Prof. S. Mrowec. Consequently, in 1970, the Faculty was transformed into the Faculty of Materials Science and Ceramics. The development of materials engineering at AGH University was strongly supported by parallel activities at Warsaw University of Technology, conducted under the supervision of Prof. W. Grabski and Prof. Wojciechowski, and at the Silesian University of Technology, under the supervision of Prof. A. Maciejny, the effect of which were faculties oriented on materials science and engineering established at those universities. Gradually, the major of materials engineering developed at other faculties of AGH University, and currently it is included in teaching and research at all technical universities in the country. Prof. Roman Pampuch was also one of the main organizers of the research society of material science and engineering centered around the Polish Materials Society and its very active member.

Prof. Pampuch's books has always played an important part in the development of materials science and engineering. Professor Pampuch transferred his extensive knowledge to thirty-one books and academic textbooks, including four published in English. They still constitute the basic sources of knowledge for scientists and students at home and abroad. Apart from the above mentioned *Solid state chemistry*, which is fundamental and still up-to-date, the first original textbook in Poland entitled *Fundamentals of Materials Science* and subsequent numerous books in this scope should be mentioned.

The approach in the spirit of materials engineering resulted in developing in the Department of Materials Science and Special Ceramics of AGH, under the supervision of Prof. Pampuch, a number of technologies of advanced materials, which were also implemented into production. Professor Pampuch was also interested in unconventional materials technologies, particularly the self-propagating high-temperature synthesis, called SHS. In this field, his contribution into the development of the world science was the application of SHS to the synthesis of covalent compounds, discovering the specific mechanism of the "wandering reaction area" in SHS and new methods of shaping a unique microstructure of ceramic materials using SHS. Among others, ceramic powders of nitrides and carbides as well as new compounds of, among others, the MAX phase were obtained this way.

Prof. Pampuch's achievements also include chemical crystallisation from the gas phase of, among others, diamonds. In the seventies, such research works and solutions were pioneering. In reference to his previous experience in the research on carbons, Prof. Pampuch continued his work in the scope of physical chemistry of carbon and processes of carbonization of organic compounds, and developed – together with his colleagues – new materials in the form of fibres and carbon and carbon composites, functioning as bioactive implants. Therefore, he was one of the forerunners of the new scientific discipline, i.e. biomedical engineering.

Prof. Pampuch created at AGH University of Science and Technology a modern scientific school of materials engineering in the scope of ceramic materials, which was known and acknowledged around the world. He was the supervisor of thirty-three doctors of this specialisation, ten of which was conferred the degree of *doctor habilitated* and the title of *professor*. The scientists educated by Prof. Pampuch created their own teams, which continued their Leader's works. The professors, which can be included in this circle, are Krzysztof Haberko, Wiesław Ptak, Ludosław Stobierski, Stanisław Jonas, Jerzy Lis, Stanisław Błażewicz, Marta Błażewicz, Jan Chłopek and others, who belonged to subsequent, younger generations.

In 1964, Prof. Pampuch organized the Ceramic Sciences Commission of the Branch of the Polish Academy of Science in Kraków, and their paper the Bulletin of Ceramic Sciences Commission, which has been operating ever since. Prof. Roman Pampuch was co-organiser not only the Polish Materials Society but also the Polish Ceramic Society and the Polish Biomaterials Society, which societies conferred the title of *Honorary Member* on him.

In 1996, Professor Pampuch was awarded the prize of the Prime Minister of Poland for his scientific achievements. He also received the prizes of the Minister of National Education and Rector of AGH University for his scientific and education achievements. In 1999, at the request of the Board of the Faculty of Materials Engineering and Ceramics, he was conferred the title of *doctor honoris causa* by the Senate of AGH University for his outstanding contribution into the development of materials science and ceramic materials engineering, establishing the Polish school of special ceramics known around the world, and special services in teaching and popularising the knowledge in this field. In 2006, Prof. Pampuch – as a resident of Kraków, who rendered great service to the city – received the Prize of the City of Kraków. In 2015, he was awarded the Antoni Hoborski Prize for his lifetime activity in chemistry.

Prof. Pampuch was a leading scientist of the world and European materials science and engineering and unquestioned authority in ceramic materials. In 1988, he was one of the six founding members of the World Academy of Ceramics and the editor-in-chief of its Ceramics International journal until 2012. Prof. Pampuch was a member of editorial boards of many research journals and scientific committees of several World Ceramic Congresses, and was also invited to deliver keynote and invited lectures at international conferences. As a visiting professor, Prof. Pampuch gave lectures at a dozen or so universities in the USA, Japan, Great Britain, France, Germany, Belgium and Italy. For his scientific and organisational achievements, he was honoured with the Leo Stuijts Prize, awarded by the European Ceramic Society, and the honourable Fellow of ECERS title.

Prof. Roman Pampuch's funeral took place on 21 February 2017 at Podgórze Cemetery in Kraków. It was attended by a numerous circle of his friends, colleagues, students and alumni, who said goodbye to the outstanding scientist, devoted teacher and wonderful person.