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Professor Tomasz Chmielewski, Ph.D., D.Sc. (1950–2024)

Tomasz Chmielewski, Associate Professor at the Wroclaw University of Science and Technology, passed away on January 15, 2024. His colleagues, students, and co-workers unanimously agree that he was not only a brilliant researcher and educator but also a wonderful friend. His presence will be greatly missed.

Born in 1950 in Garbów, Eastern Poland (Lublin Voivodeship), Professor Chmielewski spent most of his life in Wroclaw. He graduated from high school in 1968 and soon after, began his studies at the Faculty of Chemistry at Wroclaw University of Science and Technology. In 1973, he completed his master's thesis, *Studies on the Application of the Pb, PbSO4/SO4 Electrode in Aqueous Solutions*, under the supervision of Professor Franciszek Łętowski. Just a year later, in January 1974, he joined the university's Faculty of Chemistry, specifically the Institute of Inorganic Chemistry and Rare Element Metallurgy in the Hydrometallurgy Research Group, as a research assistant.

In 1982, Professor Chmielewski defended his doctoral dissertation on I*ntensification of the Sulphide Leaching Process of Copper Concentrate in the Light of Electrochemical Research*, earning his PhD in chemical sciences. He continued his scientific work as an Assistant Professor in the Department of Hydrometallurgy under Professor Witold Charewicz's mentorship. In 2016, he received his D.Sc. (habilitation) degree, specializing in chemical technology, based on his work titled *Recovery of Copper and Associated Metals from Polymetallic Sulphide Copper Ores from the Legnica-Głogów Copper Belt Using Hydrometallurgical Methods*.

Throughout his academic career, Professor Chmielewski's research focused on the electrochemistry of metal sulphides, a foundation for mineral flotation and metal leaching. Much of his work dealt with minerals from the Legnica-Głogów Copper Belt (LGOM), and his research directly influenced technological advancements in minerals and metals extraction.

Professor Chmielewski was deeply passionate about advancing hydrometallurgy, particularly for the non-ferrous and precious metals crucial to the Polish copper industry. He demonstrated that hydrometallurgical techniques could complement the energy-intensive pyrometallurgical methods used in Polish copper production. His research contributed to the search for sustainable methods of processing copper-bearing shale, a key component of LGOM deposits, through the BIOSHALE project, an international initiative funded by the European Union.

One of his significant achievements was developing a hybrid flotation-hydrometallurgical method for processing copper ore, in collaboration with Professor Andrzej Łuszczkiewicz. This method, which involved chemically modifying shale products with sulfuric acid within the flotation system, greatly improved the efficiency of copper ore enrichment and reduced metal losses. This innovative approach was implemented at the Polkowice Copper Mine, substantially increasing copper yields. Additionally, it provided an industrial solution for utilizing sulfuric acid produced during copper smelting.

In recent years, Professor Chmielewski led the HYDRO project under the IniTech initiative, funded by the National Centre for Research and Development (NCBiR). The project focused on hydrometallurgical processing of copper byproducts and concentrates, leading to highly efficient copper recovery alongside the recovery of associated metals such as Ag, Pb, Co, Ni, Zn, Mo, and V from poor polymetallic concentrates. His work addressed a long-standing challenge in pyrometallurgical processing—recovering valuable metals that are often lost.

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Professor Chmielewski's contributions to hydrometallurgical technology have made him word-wide expert in this field. His passion for hydrometallurgy inspired a new generation of metallurgists, particularly in the copper industry. Known for his directness and wit, he earned the admiration of his colleagues and students alike.

His international collaborations extended to some of the world's leading hydrometallurgy experts, including Fathi Habashi, J.F. Dutrizack, D. Dreisinger, D.E. Spiller, C.G. Anderson, and D.G. Dixon. He participated in numerous global conferences, presenting his research at events such as Copper Cobre (Toronto, 2007; Hamburg, 2010), the SIPS-FLOGEN STARS OUTREACH Fray Symposium (Cancun, 2011), and the International Mineral Processing Congress (IMPC) in Beijing, Brisbane, New Delhi, and Santiago de Chile.

Throughout his career, Professor Chmielewski maintained strong connections with both Polish and international research institutions. He worked at the Ames Laboratory at Iowa State University in the U.S. and taught at the University of the Witwatersrand in Johannesburg. He also contributed to the European Minerals Engineering Course for Erasmus Mundus students.

As either a leader or co-leader in various research initiatives, Professor Chmielewski collaborated with the Polish Academy of Sciences, the Committee for Scientific Research, and the domestic copper industry. From 2007, he was a member of the Mining Committee of the Polish Academy of Sciences and served on the Editorial Board of the journal Physicochemical Problems of Mineral Processing. In 2014, he was awarded the title of Mining Director of the Third Degree by the Polish Minister of Economy.

His academic output includes 129 publications, 52 research reports, and 9 patents.

Professor Chmielewski's other great passion was teaching. Beloved by students, he trained numerous engineers who now work in the chemical, metallurgical, and mining industries. He was instrumental in establishing the hydrometallurgical laboratory at Wroclaw University of Science and Technology, a unique research center for advanced metal recovery processes. He also co-authored the educational project Young Chemist Experiments, designed for junior high school students, and received the *Docendo Discimus* award from the university for his outstanding contributions to teaching in 2010.

Since 1968, Professor Chmielewski had been a central figure in organizing reunions for Chemistry Division graduates of Wroclaw University of Science and Technology. He is survived by his wife, Bożena Staszczuk-Chmielewska, and their two children.

We honor his memory and the lasting impact he has made on science, teaching, and the copper industry.

Andrzej Luszczkiewicz
Wroclaw University of Science and Technology, Poland

Jan Drzymala
Wroclaw University of Science and Technology, Poland

Pshem Kowalczuk
Norwegian University of Science and Technology, Norway

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