95 Years of the Department of Non-Ferrous Metallurgy at UrFU

The Department of Non-Ferrous Metallurgy of Ural Federal University celebrates its 95th anniversary in 2025. Founded in 1930 by Vasily Ivanovich Smirnov (1899–1972), later Professor, Doctor of Technical Sciences, and Academician of the Academy of Sciences of the Kazakh SSR, the department has become one of Russia's leading centers of research and education in metallurgy. Over its history, it has trained more than 2000 engineers, bachelors, and masters (including over 100 international graduates), along with 140 Candidates and 24 Doctors of Technical Sciences.

Research and scientific legacy

Since the 1930s, the department has developed a strong research tradition in the field of "Complex Utilization of Raw Materials". Its studies have focused on the metallurgy of copper, nickel, cobalt, zinc, as well as precious and rare metals, with many research outcomes successfully implemented in industrial practice.

Professor V.I. Smirnov led the department for 40 years. A prominent scientist, engineer, and educator, he authored more than 350 articles, about 40 monographs and textbooks, and mentored hundreds of engineers and dozens of postgraduate researchers. His contributions earned him election as a full member of the Academy of Sciences of the Kazakh SSR and the honorary title Honored Scientist and Engineer of the RSFSR.

Period of expansion (1971–1988)

From 1971 to 1988, the department was chaired by Professor I.F. Khudyakov, a 1944 graduate and veteran of the World War II. Under his leadership, laboratories in pyrometallurgy and hydrometallurgy were modernized, new instrumental analysis methods and computing technologies were introduced, and student research activity intensified. Research into the processing of secondary raw materials expanded significantly. Notable academic contributions of this period include Hydrometallurgy of Copper (1974), Metallurgy of Copper, Nickel, and Cobalt (2nd edition, 1977), Technology of Secondary Metals (1981), Thermodynamics and Kinetics of Hydrometallurgical Processes (1986), and Metallurgy of Secondary Heavy Non-Ferrous Metals (1987).

Professor Khudyakov also served as Vice-Rector for Research (1968–1978), was awarded the title Honored Scientist and Engineer of the RSFSR (1977), and received the USSR Council of Ministers Prize (1985).

Leadership of Professor S.S. Naboychenko (1988–2018)

From 1988 to 2018, the department was led by Professor Sergey Sergeyevich Naboychenko, a 1963 graduate, Doctor of Technical Sciences, and Corresponding Member of the Russian Academy of Sciences in the field of "Physical Chemistry and Technology of Inorganic Materials" (2000).

Professor Naboychenko is a two-time government laureate of the Russian Federation Prize in Education (2000, 2005), Honored Scientist and Engineer of the Russian Federation (1992), and Honorary Worker of Science and Higher Education (Mongolia, 1988). His international recognition includes honorary doctorates from Mongolian Technical University (1992) and Orenburg State Technical University (1998), as well as membership in the American Society for Metals Engineers since 1995. He has also received the RAS I.P. Bardin Prize (2016), the Governor of Sverdlovsk Region Prize (2016), and numerous state and professional honors, including the Orders "For Services to the Fatherland" (III and IV Class).

Alongside his scientific work, Professor Naboychenko played a major role in academic governance, serving as Rector of USTU-UPI (1986–2007), Chairman of the Council of Rectors of Sverdlovsk Region and the Ural Federal District, and Vice-President of the Russian Union of Rectors.

Scientific school and research areas

The Department of Non-Ferrous Metallurgy has established a recognized scientific school, "Metallurgy of Non-Ferrous Metals", dedicated to solving problems of extracting and processing non-ferrous metals from both ore and technogenic raw materials:

— pyrometallurgical and autogenous technologies;
— autoclave processes;
— sorption technologies.

The department maintains postgraduate and doctoral programs in specialty 2.6.2 "Metallurgy of Ferrous, Non-Ferrous, and Rare Metals". In the last de-

cade alone, 44 full-time doctoral students and 8 external candidates have been trained, resulting in 7 doctoral and 30 candidate defenses.

Academic and industrial contributions

The department houses advanced laboratories in hydrometallurgy, pyrometallurgy, autoclave and sorption processes, secondary and technogenic raw material processing, physicochemical analysis, computer modeling, and mineral beneficiation.

Over its history, the department has published more than 80 textbooks and monographs, and over 1000 scientific articles. For their comprehensive contributions to metallurgy education, faculty members (S.S. Naboychenko, I.F. Khudyakov, S.V. Karelov, A.P. Doroshkevich, N.G. Ageev, and S.E. Klein) received the Government of the Russian Federation Prize in Education. Staff have carried out more than 300 research projects and obtained over 170 USSR author's certificates and Russian patents, participating in more than 10 state scientific and technical programs.

Today and the future

The department continues to uphold the traditions established by Professors Smirnov, Khudyakov, and Naboychenko: dedication, responsibility, strong ties with industry, and the pursuit of advanced scientific directions. Collaborations with universities in Kazakhstan, Kyrgyzstan, Mongolia, and Uzbekistan are being strengthened.

With the Urals remaining a global leader in non-ferrous metallurgy and possessing significant reserves of both ore and secondary raw materials, the department looks to the future with a focus on training highly qualified scientific personnel, conducting fundamental research, and deepening its industrial partnerships.

The pride of the Department remains its graduates.

Happy Anniversary to the Department of Non-Ferrous Metallurgy, UrFU!

Head of the Department S.V. Mamyachenkov