

# Chair of Metallurgical Processing Techniques

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## Chair of Metallurgical Processing Techniques

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The Chair of Metallurgical Processing Techniques is involved in educational activities for the university programme in Materials and Metallurgy and the higher professional programme in Metallurgical Technology and offers courses in the following areas: thermodynamics of materials, processing metallurgy of iron and non-iron metals, theory of metallurgical processes, metallurgic ceramics and hypothermic technologies and corrosion.

Our researchers are engaged in basic science as well as in industry technologies. We have established close cooperation with industry in the following areas: thermodynamic and kinetic modelling, modelling of metallurgical processes, construction of phase diagrams, development of non-metal inorganic materials, metallurgic slags, oxidation, thermal analyses and structure of metal materials, archaeometallurgy, the analysis and structure of metal materials, slags, metallurgic and other ceramics, manufacturing of metal and ceramic materials, the continuative and classical infusion of iron and iron alloys, steel and non-iron metals, the economy of production processes of metal and ceramics systems, hypothermic reactions in solid, liquid and gas states, hypothermic oxidation, the processes of agglomeration of non-metal and metal materials, recycling of metal and ceramic materials, the development of new or improved characteristics of metal and ceramic materials and their production technologies, microanalysis, nanotechnologies in metal and ceramics processing techniques, workplace and environment safety and high-temperature reactions in a vacuum.

In the laboratory, we have equipment to carry out thermal analyses, electro-chemical measurements, material synthesis with melting capabilities up to 2000°C in various atmospheres and sintering. Another area of work is

measurements in metallurgic and mineralogical processing techniques for metal and non-metal materials. Physical modelling of metallurgic reactors (for example streaming of a melt in the reactor, chemical reactions such as decarbonation of a melt in the process of extraction of metal materials). With the melting microscope, the processes of softening, blowing up, sintering, melting, etc. of metal and non-metal materials up to 1350°C can be studied.

Our laboratory carries out research in the field of thermodynamics for educational and scientific purposes. Our focus is mainly on metal and other inorganic and non-metal materials. The laboratory is equipped with: STA device Netzsch STA Jupiter, DTA analyser DTA 701, Dilatometer, high precision mass balances, melting microscope, etc.

