



Mineralogical Society of Poland

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YOUNG RESEARCHERS AWARDED

The winners of the competition for the best theses in mineralogy, petrology, and geochemistry have been announced by the Mineralogical Society of Poland. The award for the best doctoral dissertation was granted to Dr. Eng. Krzysztof Kupczak, while the best master's thesis was awarded to MSc Eng. Marta Esmund. Distinctions were also given to Dr. Eng. Julia Sordyl and MSc Eng. Agnieszka Węgrzyn.



Winners of the PTMin awards for the best diploma theses in the company of the President of PTMin, the supervisors of the awarded theses, and members of the Competition Committee. (LEFT TO RIGHT): Dr. habil. Marek Szczerba, Prof. of ING PAN; Dr. Eng. Krzysztof Kupczak; MSc Eng. Marta Esmund; Prof. Dr. habil. Eng. Maciej Manecki; Prof. Dr. Eng. Jarosław Majka; Dr. Magdalena Pańczyk-Nawrocka.

Dr. Eng. Krzysztof Kupczak of the University of Silesia in Katowice completed his doctoral research under the supervision of Professor Aleksandra Gawęda and Dr. Rafał Warchulski. His work focuses on historical metallurgical slags, offering new insight into past metal production processes. The aim of his research was to quantitatively reconstruct the physicochemical conditions under which metals were smelted in historical times across present-day Poland. Metallurgical slags—often the only surviving remnants of ancient smelting activities—serve as durable records of key technological parameters such as temperature, melt viscosity, and oxidation–reduction conditions. By analyzing these materials, it becomes possible not only to recreate the course of historical metallurgical processes, but also to document and help preserve Poland's industrial heritage, which is increasingly at risk of disappearing due to neglect or removal. As part of his work, Dr. Kupczak developed and validated new methods for reconstructing process parameters. Notably, he was the first to apply predominance area diagrams (PAD) to quantitatively determine the volatility of gaseous components. He also created an original computer program called SLAG, written in Python and equipped with a user-friendly graphical interface. This tool enables rapid and intuitive estimation of key smelting parameters based on the chemical and phase composition of slags. His research has been widely published in journals such as *Archaeometry*, *Heritage Science*, and *Minerals*.

The award for the best master's thesis went to **MSc Eng. Marta Esmund** of AGH University of Kraków. Her research was supervised by Professor Maciej Manecki (AGH) and Dr. Alicja Wudarska from the Institute of Geological Sciences of the Polish Academy of Sciences. The study was partially funded by the National Science Centre (project no. 2023/49/B/ST10/03922) and forms part of a broader project entitled "Oxygen isotopes in Baltic conodonts as indicators of climate change in the

Ordovician." The objective of her work was to establish a robust methodological framework for the characterization of conodont elements prior to oxygen isotope analysis using secondary ion mass spectrometry (SIMS). While polarized light microscopy was employed, the main emphasis was placed on fluorescence microscopy and Raman spectroscopy. For the first time in conodont research, high-resolution Raman mapping was used, enabling a detailed examination of microstructure and compositional variability. The results demonstrate that the hyaline crown (the dense, glass-like outer layer of the conodont element) is the most suitable tissue for SIMS-based oxygen isotope analysis, primarily due to its low porosity and relative homogeneity. At the same time, Raman spectroscopy data highlight the significant role of organic matter, which may influence isotope interpretations and should be taken into account in future studies. The methodological approach developed in this work provides a valuable tool for the preliminary selection and characterization of conodont samples for in situ isotope analysis, ultimately enhancing the reliability of future paleoclimate reconstructions.

We warmly congratulate the winners and their supervisors and hope that these awards are just the beginning of long and promising scientific careers.

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