CHEMICAL COMPOSITION OF METEORITES AS REPRESENTATIVE MATERIAL FOR POTENTIAL METALLIC RESOURCES OF THEIR PARENT BODIES

K. Łuszczek[1], T. A. Przylibski[1]. [1]Wroclaw University of Technology, Faculty of Geoengineering, Mining and Geology, Na Grobli 15, 50-421 Wroclaw, Poland, e-mail katarzyna.luszczek@pwr.edu.pl

Introduction: Since 6 years at Wrocław University of Technology the research concerning the metals content in different groups of meteorites are carried out. Data for iron meteorites and all chondrites' groups were analyzed so far.

Data and methods: Bulk chemical composition data of all chondrites as well as iron meteorites groups were studied. For chondrites author's data (ICP MS, ICP ES and XRF) [1,2] while for iron meteorites literature data [3,4] were used.

Disscusion: The results shows that among chondrites ordinary as well as enstatite chondrites are especially important from prospective geology point of view. As they came from undifferentiated objects the concentration of metals in both clans is in case of Fe, Ni, Cr, Co, Au, Pd, Pt is higher than in the Earth's crust. The concentration of Fe, Ni and PGMs is at the level of today mined terrestrial deposits. Moreover, enstatite chondrites have advantage of having almost all Fe in the form of native iron. But from the other side the ordinary chondrites are the best studied meteorites' group and their parent bodies are also the best known asteroids.

Is obvious that iron meteorites have the highest metal content among meteorites. However, during differentiation processes same of important metals escape to silicate phases. A lot of effort is needed to find their parent bodies as interpreting their spectra and distinguish them from e.g. enstatite chondrites' parent bodies is not easy task.

Conclusions: Both chondrites' and iron meteorrites' parent bodies have significant metal content and would be attractive for future space mining. Their parent bodies could be consider as metallic deposits.

However, chondrites, as they are sedimentary rock, seems to be more easily mined as they are similar to terrestrial today mined ore deposits. Their parent bodies are the best studied minor bodies so far.

References:

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