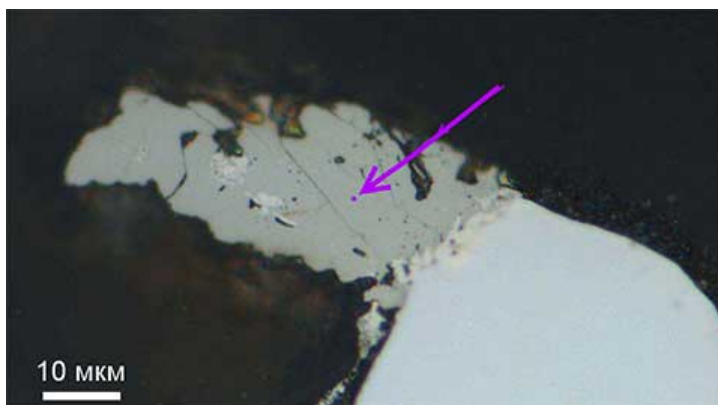


SibFU researcher co-authors fleetite discovery

An international research team (Russia, the USA, Italy, and Canada), which includes SibFU scientist Gennady Shvedov (assistant professor at the Department of Geology of Deposits and Exploration Methods), has discovered a new mineral, fleetite, and studied its properties.



*'Fleetite, a mineral with chemical formula $\text{Cu}_2\text{RhIrSb}_2$, was discovered as an unknown phase containing copper, rhodium, iridium, and antimony by researchers from V.S. Sobolev Institute of Geology and Mineralogy of the Siberian Branch of the RAS (Novosibirsk). They transferred the material to Siberian Federal University to clarify the optical (reflection coefficient) and chemical (composition) properties of the identified phase,' said **Gennady Shvedov**.*



The study was carried out at the Nor Nickel R&D Centre with the help of SibFU postgraduate students Boris Lobastov and Sergey Silyanov. The material containing fleetite was discovered at a placer on the Miass River (Chelyabinsk Region, Ural). At the moment, this is the first and so far the only find of fleetite in the world.

'Fleetite is an intermetallic compound of metal and semimetal elements. The mineral has unique nature because it has a previously unknown crystalline structure, where the atoms of rhodium and iridium are in separate structural positions and do not replace each other, as is usual in case of other minerals of rhodium and iridium. There are more than 120 minerals known worldwide that contain platinum group metals, including 14 iridium minerals and 13 rhodium minerals. These and other platinoids can form intermetallic compounds with iron, nickel, copper, tin, lead, antimony, bismuth, silver, gold and other metals and semimetals. For example, we know oulankaite, a mineral with a more complex structure of $\text{Pd}_5\text{Cu}_4\text{SnTe}_2\text{S}_2$, which was, by the way, second discovered in Krasnoyarsk Territory (the first discovery of this mineral was on the Kola Peninsula),' continued the researcher.

The researchers explained that they had just started studying the properties of fleetite. For now, it is known that it is a mineral with cubic system and $\text{Fd}\bar{3}\text{m}$ space group.



*'How to use the mineral in the industry will become clear only after clarifying its physical properties. For this purpose, we will prepare artificial phases of similar composition for further research. The use of a similar phase in electronics, radio engineering and other related fields is also possible, though it's too early to talk about it,' noted **Boris Lobastov**, engineer of the Analytical Laboratory of the Nor Nickel R&D centre.*

The researchers consider fleetite as absolutely safe for humans. By the way, the size of the discovered

mineral is only 31×46 microns, and the sample is kept in the Museum of Geology of Central Siberia, in Krasnoyarsk. Fleetite is named after the professor of mineralogy Michael Fleet, a famous scientist from the University of Western Ontario (Canada).

The new mineral was registered in 2018 by the International Mineralogical Association (MMA), and studies of its properties are ongoing.

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