REE mineralisation in the Olserum area, SE Sweden

S.S. Andersson[1]*, T. Wagner[1], E. Jonsson[2,3], M. Leijd[4] and J. Berg[4]

[1]*Department of Geosciences and Geography,*
University of Helsinki, FI-00014 Helsinki, FINLAND
*(*correspondence: stefan.andersson@helsinki.fi)*
[2]*Geological Survey of Sweden, Department of Mineral Resources, SE-75236, Uppsala, SWEDEN*
[3]*Department of Earth Sciences, Uppsala University, Villavägen 16, SE-75236 Uppsala, SWEDEN*
[4]*Tasman Metals AB, Skolallen 2, SE-82141, Bollnäs, SWEDEN*

Hydrothermal transport of the rare earth elements (REE) in geological fluids is essential for the formation of economic REE mineral deposits. We are investigating the hydrothermal REE mineralisation in the Olserum area, SE Sweden, which represents an unusual and possibly new type of REE deposit dominated by high-grade REE phosphates. The area is part of a larger U±REE-enriched zone in the Palaeoproterozoic, metasedimentary Västervik formation, located at the southernmost end of the Svecofennian domain. This formation is bordered by granitoids belonging to the Transscandinavian Igneous Belt.

The Olserum area consists of several mineralised subareas, currently under exploration by Tasman Metals. The main targets are the Olserum-Djupedal areas. Monazite-(Ce) and xenotime-(Y) are the main REE phases, and they mostly occurs as veins in both areas. The REE phosphates and apatite typically occur as cm-sized, fractures crystals. The fractures are infilled by gangue minerals, mainly biotite, quartz, magnetite, amphibole, cordierite, muscovite, chlorite and tourmaline (In Djupedal). In Olserum, the mineralisation is hosted within metasediments, whereas the Djupedal area is closer to the contact zone of the adjacent granite, manifested by more complex host rock relationships and diverse mineralogy. Additional REE phases, besides monazite and xenotime, are allanite-(Ce) and REE-fluorocarbonate. Allanite is apparently younger than the bulk of the xenotime and monazite, but is itself fractured and infilled by gangue minerals, including minor amounts of REE phosphates. In both areas, monazite and allanite are also hosted in biotite-magnetite schlieren in the granite. Future work will focus on obtaining mineral chemistry and trace element data, as well as analysing fluid inclusions by LA-ICPMS, which will provide input data for thermodynamic modelling of the hydrothermal REE mineralising system.