

Calcite-Magnesite in Melt infiltrated Evaporites (Adamello, Italy)

Contact persons: Lukas Baumgartner / Florence Bégué

Context

Calcite (cc) and magnesite(mgn) should react together to form dolomite. While it might be possible to argue that reaction kinetics is too slow at low temperature, these reactions should occur during contact metamorphism. Nevertheless, coexisting mgn and cc in the Triassic evaporitic formation of the Carniola di Bovegno has been described, together with Ti-clinohumite in forsterite grade marbles, close to the contact. These rocks have spectacular infiltration textures which lead to the coexistence of cc and mgn. Calcites have high sulfur contents (up to 1 wt% SO₂!).

This Master is designed to evaluate if calcite formed by infiltration of an aqueous fluid or a calcite melt. The presence of calcite melt would influence the rheology of the rock. The heat associated with melting, as well as the fluid required to melt dolomites might be the key to understanding why many intrusions are emplaced in carbonates in the upper crust.

Objectives and Methods

- Establish the distribution and the occurrence of calcite and magnesite in the Forcel Rossa area (see image), upper Val Savio, Adamello through detailed field and thin section observations
- SEM, and FEG-EMP studies will establish the petrography and petrology of these occurrences
- This data will be augmented by ¹⁸O and ¹³C analysis of magnesite, calcite, and dolomite, using micro-drilling. Some in-situ analysis of trace elements (LA-ICPMS) will help to decipher the origin of carbonate
- Togetjer with modelling this will identify the origin of the carbonate infiltration

Literature

Floess D, Baumgartner LP (2015) Constraining magmatic fluxes through thermal modelling of contact metamorphism. Geological Society, London, Special Publications 422:41–56.

Floess D, Baumgartner LP, Vonlanthen P (2015) An observational and thermodynamic investigation of carbonate partial melting. Earth and Planetary Science Letters 409:147–156.

Floess D (2009) Contact metamorphism and emplacement of the Western Adamello Tonalite. PhD thesis Univ. Lausanne, 2009

1 photo dimension H5.5cm x L8.5cm



WEB sites

Choice of orientation :

2) Geochemistry, Alpine tectonics, Ore Deposits