



Fig. 1: Anisotropy of magnetic susceptibility before (top) and after thermal treatment (bottom).

Polyhalite microfabrics in an Alpine evaporite mélange: Hallstatt, Eastern Alps

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In the Hallstatt salt mine (Austria), polyhalite rocks occur in 0.5 to 1 m thick and several metre long tectonic lenses within the protocataclasite to protomylonite matrix of the Alpine Haselgebirge. Thin section analysis of Hallstatt polyhalites reveals various fabric types similar to metamorphic rocks of crust-forming minerals, e.g., quartz and feldspar. Polyhalite microfabrics from Hallstatt include: (1) polyhalite mylonites, (2) metamorphic reaction fabrics, (3) vein-filling, fibrous polyhalite and (4) cavity-filling polyhalite. The polyhalite mylonites contain a wide range of shear fabrics commonly known in mylonitic quartzo-feldspathic shear zones within the ductile crust and developed from a more coarse-grained precursor rock. The mylonites are partly overprinted by recrystallised, statically grown polyhalite grains. Metamorphic reaction fabrics of blödite (or astrakanite) $[\text{Na}_2\text{Mg}(\text{SO}_4)_2 \cdot 4 \text{H}_2\text{O}]$ between polyhalite seams and anhydrite have also been found. According to previous reports, blödite may occur primarily as nodules or, more commonly, intergrown with the löweite, which has a nearly identical chemical composition and is stable at higher temperatures. Reaction fabrics may have formed by exsolution, (re-)crystallisation, parallel growth or replacement. This fabric type was only found in one sample in relation with the decomposition of blödite at ca. 61°C in the presence of halite or slightly above, testifying, therefore, a late-stage prograde fabric significantly younger than the main polyhalite formation.