ECOLE LEMANIQUE DES SCIENCES DE LA TERRE
DES UNIVERSITES DE GENEVE ET DE LAUSANNE

Master ès Sciences in Earth sciences

Hematite crystallization in Alpine-type fissure veins: Genetic implications

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Context

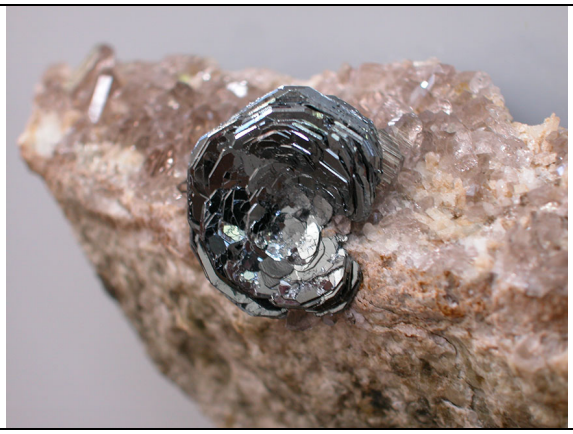
In contrast to most hematites yielding a characteristic reddish-brown streak, hematites from Alpine fissures give a black streak, probably due to its high Ti content. Even though it is assumed that hematite growth occurred under strongly oxidizing conditions, the increased Ti content reaching several weight percents in fissure hematite (Weibel and Bambauer, 1958) is considered to be the reason that such hematite does not yield the characteristic red streak. Moreover, many of these hematites show oriented intergrowth or exsolution of rutile. It has been observed that fissure hematite occurs mainly in "granitoid" lithologies and that its crystallization, occurring typically at the end of growth of quartz, is commonly associated with zeolithes, raising the question if infiltrating meteoric waters were possibly involved.

Objectives and Methods

The study is aimed at characterizing fissure hematite and at constraining its crystallization conditions.
1) Compilation of the Alpine fissure occurrences of hematite (localities, lithologies, mineral associations)
2) Study of hematite in reflected light (exsolutions and intergrowths) and transmitted near-infrared light (NIR)
3) Microthermometric study of fluid inclusions in hematite using NIR microscopy (possibly also associated rutile and quartz) from classic localities, in order to constrain crystallization conditions (P-T-X of mineralizing fluids)
4) Characterize the chemical composition of the hematites (major and minor elements by electron microprobe analysis and trace elements by LA-ICP-MS analysis)
5) Oxygen isotope analysis on hematite to constrain the origin of mineralizing fluids

Literature

Weibel and Bambauer (1958). Hämatit und Ilmenit aus den Schweizer Alpen. Schweizerische mineralogische und petrographische Mitteilungen, 38, 475-482.



WEB sites

http://institutions.ville-geneve.ch/fr/mhn/
http://www.unige.ch/sciences/terre/en/research/mineral-resources-and-geofluids/

Choice of orientation : (supprimer les orientations qui ne conviendraient pas)

2) Geochemistry, Alpine tectonics, Ore Deposits