

Sujets de Diplôme (avec Prof. T. Vennemann)

Projet A:

« Argiles de la Molasse Alpine: archives du changement de la paléotopographie des Alpes »

Clay minerals formed by surficial weathering of Alpine rocks in the presence of meteoric water and deposited in the Alpine Molasse sediments may represent archives of the paleoelevation through their stable isotope compositions. Hence, studies of the mineralogy and isotope geochemistry of clay minerals from sections of the Molasse sediments, may quantify the changes in paleoelevation of the Alps during deposition of the Molasse sediments. Clay-rich horizons from Molasse sediments both north and south of the Alps will be investigated in order to establish the potential existence of a north-south gradient and evaluate possible rain-shadow effects and prevailing wind directions. In addition, clay minerals from weathering profiles within the Alps will be analysed for comparison.

The study will involve field work for sample collection, and detailed laboratory work involving separation of clay minerals, characterization of the clays by X-ray diffraction, as well as stable isotope (H- and O-isotopes) analyses of clay minerals and other potentially authigenic and detrital silicates and carbonates within the sediments.

Projet B

« L'origine du gîtes métallifères et les skarns de l'île-de-Elba, Italie : implications des isotopes stables pour les interactions fluides-roches »

The Fe-ore deposits of Elba have been important Fe-ore producers for over 2000 years. They are hosted in widely different types of wall rocks. The mineralogy and textures reflect a complex history with several generations of Fe-sulfides, Fe-oxides (major ores) and complexly zoned skarns. The models for ore formation proposed so far vary widely, including sedimentary ore formation as well as magmatic or magmatic-hydrothermal concentration of ores and skarns. A detailed study of the stable isotope composition of skarn and ore minerals in a number of deposits may help to constrain the origin and involvement of fluids for these deposits and thus provide critical constraints on models of ore formation.

Material for this study is to be collected in the field from a number of ore and skarn deposits. The relationship between skarn and ore development will be investigated.