Geophysical Research Abstracts,
Vol. 11, EGU2009-10975, 2009
EGU General Assembly 2009


# Fluid control on texture and composition of REE-minerals in metasediments from the Central Alps (Switzerland)

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In metamorphic rocks, U-Th-Pb isotopic resetting at the grain-scale depends on thermally induced diffusion and/or dissolution-reprecipitation processes, and correct age interpretation requires that we can discern where fluid-assisted crystallization occurred. In this study, we address the role of fluids on the texture and composition of the REE-minerals, in order to identify intrinsic criteria of growth in presence of fluid. For this purpose, we selected metasediments recording regional Alpine metamorphism with temperatures around 400-500 °C, where solid-state diffusion is negligible. In the Urseren zone of the Central Alps, samples were collected in various types of metasediments and veins therein. These Mesozoic metasediments contain different vein types: (1) nearly pure carbonates; (2) mixed calcite-quartz and (3) nearly pure quartz veins. Most of these veins developed early in the metamorphic history, but structural criteria indicate also late veins crusscutting the first generations. Most commonly the dominant REE-mineral is allanite (in nine homogeneous meta¬sediments); it occurs as <20-50 microns grains aligned in the foliation. However, at the direct vicinity of carbonaceous veins (two samples), allanite consists rather of porphyroblastic grains (> 50-100 microns) overgrowing the main foliation. In samples with monazite (five), chemical dating using electron microprobe reveals that few grains are inherited (Variscan age) and the rest of the analyses have a Pb content below the detection limit. In comparison to inherited monazite, newly formed grains are rich in quartz inclusions and differ in phase composition. The question whether those grains grew during diagenesis or metamorphism requires complementary in situ isotopic dating. However, in a cross-cutting vein, the exclusive association of monazite with quartz indicates a late stage crystallization from a silica-rich fluid. Differences in texture, compositions and mineralogy suggest that the timing as well as the composition of the fluid may be recorded by REE-minerals, at least at low-grade metamorphism.