Geophysical Research Abstracts,
Vol. 10, EGU2008-A-04670, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-04670
EGU General Assembly 2008

Stability of REE, Y and Nb-Ta accessory minerals in the presence of fluids: An example from southern Svalbard

J. Majka (1), J. Prźek (2), B. Budzyñ (3)

(1) AGH – University of Science and Technology, Department of Mineralogy, Petrography and Geochemistry, Mickiewicza 30, 30-059 Kraków, Poland, (2) Department of Mineralogy and Petrology, Faculty of Natural Sciences, Comenius University, Mlynská dolina G, 842 15 Bratislava, Slovakia, (3) Jagiellonian University, Institute of Geological Sciences, Oleandry 2a, 30-063 Kraków, Poland

The Caledonian basement in the southern part of Wedel Jarlsberg Land, Svalbard Archipelago contain Neoproterozoic amphibolite facies metasedimentary complex. This complex comprises metapelites, paragneisses, calcite-mica schists, marbles, and also anathectic pegmatite veins. Metapelites and paragneisses exhibit microtextures related to monazite and xenotime alterations leading to formation of apatite, allanite, and REE-epidote coronas. Similar alterations were observed in anathectic pegmatites, where xenotime is replaced by apatite and gadolinite-(Y). Moreover, replacement of allanite by epidote and apatite was also observed, and can be related to the monazite breakdown. Alterations affected also Nb-Ta minerals occurring in the same pegmatite. Ferrocolumbite and manganocolumbite are replaced by fersmite and yttropyrochlore-(Y). Fersmite and yttropyrochlore-(Y) form also veinlets cutting the columbite grains. The pyrochlore group minerals (mainly yttrobetafite-(Y) and betafite) partially replaced by Fe oxides are present as inclusions in quartz. Betafite forms also intergrowth with calcite in veinlets. Titanite is reflects breakdown to Ti oxides and unidentified silicates assemblage. The primary pegmatite bodies are cut by the secondary hydrothermal veins comprising chlorite, Ca-carbonates, pyrite and allanite.

Secondary alterations observed in studied samples were probably driven by the Ca-enriched fluid mobilized during retrogression after Neoproterozoic metamorphism.

Proposed article will present new data on the reactivity and importance of fluids and their influence on stability of several accessory phases.

This work was supported by the Slovak Research and Development Agency under the contract No. APVV-0557-06.