Cpx-rich Dehydration Zones in the Sveco-Norwegian of SW Sweden

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The Varberg Charnockite in SW Sweden represents a large lower crustal intrusion into high-grade country rocks of the Eastern Segment of the Sveco-Norwegian Province. Near to the charnockite body canalized (OH)-poor zones (dehydrated?) of pyroxene-bearing rocks are occurring in bt-hbl bearing gneisses.
A ca. 25m traverse across one of these zones is studied in detail and reveals strong chemical and petrological changes. The pyroxene-bearing zone is characterized by the growth of large cpx crystals. The chemical analysis of the zone indicates the lower SiO_2 and higher K_2O, Foe and MgO concentrations of the cpx-dominated zone. Chemical differences are due to higher kfs/plag ratio and higher amount of mafic minerals (cpx, grt) in the cpx-zone. There is no evidence für primary (magmatic) magmatic induced chemical heterogeneities.
Temperature and pressure calculation using the recalculation of dynamically recrystallized ternary feldspars, Fe/Mg exchange (grt-cpx, grt-hbl, grt-bt) - and the garnet-amphibole-plagioclase-quartz barometer shows that the dehydration zone and the surrounding gneiss have suffered similar PT conditions. Peak conditions are in the range of 680-720°C/ 0,8-0,9 GPa.
The fluid situation in the process zone as indicated by Raman probe fluid inclusion studies is characterized by the predominance of CO_2 in the cpx-zone in contrast to frequent H_2O inclusions in the country rock. Solid inclusions are not observed. Fluid inclusion studies and the evaluated temperature range results in the (preliminary) estimation of a_{H2O} lower than 0.25. Detailed analysis of apatite across the cpx-dominated zone shows an increase in Ce_2O_3 and Cl in the dehydration zone and a decrease of Y_2O_3. Assuming a non-magmatic dehydration origin of the cpx zone the reacting and metasomatizing agent is rich in CO_2, Cl and K_2O.
Assuming similar ages, we suggest that the dehydration zone is formed by CO_2fluid flush originated from the degassing Varberg Charnockite.

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