

Dehydrated rims as metasomatic diffusion zones in the granulite facies of Rogaland (SW Norway)

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In the Rogaland-Vest Agder Province of Southern Norway, dehydrated plagioclase-pyroxene rims (opx-cpx) are observed in various occurrences at the contact between basic and acidic granulites. Their occurrence is restricted to the transition between amphibolite and granulite facies where hornblende is no longer stable in the presence of quartz. Field and petrographic data suggest that their development postdates any deformation.

Three different types of zoning have been distinguished on the basis of the number of zones (1 or 2) and mineralogical composition. When plagioclase and pyroxenes show a contrasted composition between metabasite and gneiss, there is a progressive compositional evolution of these minerals in the zones, a feature characteristic of a metasomatic diffusion process. Mass balance estimates have been made with reference to a perfectly inert component.

In a μSiO_2 - μCaO diagram, the three different types of zoning can be shown, suggesting that these parameters are controlling the observed reactions. On the other hand $\mu\text{H}_2\text{O}$ - μSiO_2 diagram suggests that an $a_{\text{H}_2\text{O}}$ gradient is not a prerequisite to the zoning development and that H_2O is not an excess component, i.e. reaction borders were formed in fluid present conditions.

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