

PETROLOGY OF AN UNUSUAL CA-AMPHIBOLE + STAUROLITE BEARING AMPHIBOLITE AND ITS IMPLICATIONS FOR THE HIGH PRESSURE METAMORPHISM IN THE SCHNEEBERG COMPLEX, EASTERN ALPS

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Within the paleozoic Austroalpine Schneeberg Complex, unusual Al-rich staurolite-bearing assemblages have been found. In two localities, the assemblage staurolite + kyanite + zoisite + clinozoisite/epidote + margarite assemblages were found in metamarls. These assemblages form within the contact between calcite marble, interlayered calc-micaschists and amphibole-bearing metamarls.

In one of these localities, the assemblage staurolite + Ca-amphibole was found within an garnet amphibolite sample, but careful textural examination revealed that Ca-amphibole and staurolite are part of entirely different kinds of domains: staurolite occurs within Al-rich domains in the assemblage staurolite + margarite + kyanite + clinozoisite/epidote + plagioclase + biotite + muscovite without quartz, while Ca-amphibole is confined to Al-poor domains containing the assemblage Ca-amphibole + calcite + clinozoisite/epidote + biotite + plagioclase + quartz with strong similarities to assemblages from adjacent amphibolites. Although both assemblages occur within a thin section, they show different reaction histories. The Al-poor domains are characterized by the breakdown of the assemblage Ca-amphibole + muscovite and the Al-rich domains show an equilibrium assemblage containing margarite + kyanite + plagioclase + clinozoisite/epidote, which probably

developed by a complete consumption of quartz.

Application of thermobarometry to the adjacent rocks and the Al-rich domains within the sample of these staurolite + Ca-amphibole bearing garnet amphibolites yields pressures of 8–10 kbar at temperatures of 540 – 590°C, by using selected equilibria in the system NCMASH. These high pressures may be interpreted in favour of an overall pressure increase of the Eo-Alpine metamorphism from NW towards SE within the Ötztal-Stubai Crystalline Complex, culminating in the formation of Eo-Alpine eclogites in the southwest of the Schneeberg Complex.

Therefore a continuous transition from a regional metamorphic amphibolite facies to an eclogite facies due to crustal thickening in the course of a beginning Penninic subduction during early Cretaceous may be assumed.

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