

mehrere Teilstörungen der Pull-Apart-Struktur als sinistrale Blattverschiebungen und Schrägabschiebungen aktiv sind. Quartäre und rezente Bewegungen und Bewegungsgeschwindigkeiten von 1 bis 2 mm/a werden von den Mächtigkeiten der Sedimentfüllung quartärer Pull-Apart-Becken (Mitterndorfer-, Lasseer Becken), aus dem Versatz und der Verkipfung quartärer Terrassen,

sowie aus GPS-Messungen abgeleitet. Seismologische Daten weisen darauf hin, dass die aktiven Störungen des Wiener Beckens Teil eines Störungssystems sind, das wie im Miozän von den zentralen Ostalpen bis in die Westkarpaten reicht, und das mit Out-Of-Sequence-Überschiebungen in den Galizischen Karpaten verbunden ist.

Garnet-cordierite thermobarometry in high-grade metapelites from the Sauwald, Southern Bohemian Massif

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The Sauwald area is located in the southern rim of the Bohemian Massif and contains migmatites and high-grade metapelitic and granitic gneisses. These rocks were metamorphosed during the post-collisional high T /low P stage of the Variscan metamorphic event (~330 Ma). The metapelitic samples were taken from two localities near Kößldorf and Pyret in Upper Austria. The investigated samples contain the mineral assemblage garnet + cordierite + spinel + sillimanite + K-feldspar + quartz + biotite + muscovite + magnetite + graphite. The peak metamorphic assemblage is: garnet + cordierite + spinel + sillimanite + K-feldspar + quartz. The absence of muscovite and the presence of K-feldspar porphyroblasts and sillimanite needles suggest that the dehydration of muscovite took place already. The biotites show textures indicating partial melting (e.g. biotite-quartz myrmekites) but the absence of orthopyroxene indicates that the P - T conditions did not exceed the thermal limit (e.g. dehydration breakdown) of the biotite stability field. Garnet contains spinel, sillimanite and cordierite inclusions and exhibits a slight chemical zoning with increasing Fe contents towards the rims. Cordierite shows no obvious chemical zoning in Fe and Mg, but shows a slight increase in the Na content from the core to the rims from 0.029 to 0.043 Na a.p.f.u. An important part of the evaluation of the P - T - $a(\text{H}_2\text{O})$ conditions of these high-grade metapelites is the application of thermobarometric techniques involving cordierite. In recent years, an extensive evaluation of cordierite as a petrogenetic indicator in high-grade metapelites was performed (Mirwald and Knop, 1995; Knop and Mirwald, 2000). These studies focused on the incorporation of sodium in cordierite as a function of temperature, pressure and $a(\text{H}_2\text{O})$. Mirwald (1986) and Knop and Mirwald (1999, 2000) found an inverse correlation between the sodium content and temperature, allowing a potential application of this relation as a thermometer. Their study also showed that the incorporation of sodium into cordierite is virtually

pressure-independent. Knop and Mirwald (2000) and Scheikl and Mirwald (1998) showed that the sodium content of cordierite is also a monitor of the presence of fluid or melt in metapelitic rocks. Therefore, the sodium content of cordierites may also serve as a monitor for $a(\text{H}_2\text{O})$ in the rocks. Our data indicate temperatures of ca. 650 – 700°C for the cordierite cores in the presence of a fluid phase in an $a(\text{H}_2\text{O})$ range of 0.5 to 1.0. The Na content of cordierite in the presence of melt would indicate temperatures exceeding 850°C! The frequently observed assemblage cordierite + garnet in migmatites can also be used as a geobarometer based on the divariant reaction (Mg, Fe)-cordierite = (Mg, Fe)-garnet + aluminosilicate + quartz + H_2O (Mirwald and Knop, 1995). Using the Mg# of the garnet and cordierite cores yields pressures of ca. 4 kbar for temperatures of 750°C. These data will provide important independent P - T estimates in addition to thermobarometric estimates based on multi-equilibrium methods.

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