this discrepancy, we considered the errors associated with analytical diffusion modelling (effective binary diffusion coefficients, EBDCs). In a first step we refitted the experimental data of Chakraborty & Ganguly (1992) and Loomis et al. (1985) for Fe, Mg and Mn diffusion in garnet (including cited errors) to the logarithmic form of equation (1) by applying a least squares method:

$$D^*_i(P,T) = D_0 \exp[(-\Delta E - (P-1)\,\Delta V^+)/(RT)] \quad (1)$$

(where $D^*_i(P,T)$ is the tracer diffusion coefficient of element i, D_0 is the pre-exponential constant, ΔE is the activation energy, and ΔV^+ is the activation volume for diffusion).
The regressed values and their correlation coefficients (ρ) are:
Fe: $\ln(D_0) = -9.78 \pm 2.74$ cm^2/s, $\Delta E = 59014 \pm 6968$ cal/mol, $\Delta V^+ = 0.121 \pm 0.077$ cm^3/mol,
$\rho_{\ln(D0)-\Delta E} = 0.96$, $\rho_{\ln(D0)-\Delta V+} = 0.53$, $\rho_{\Delta E-\Delta V+} = 0.73$,

Mg: $\ln(D_0) = -8.34 \pm 2.01$ cm^2/s, $\Delta E = 63868 \pm 5107$ cal/mol, $\Delta V^+ = 0.112 \pm 0.056$ cm^3/mol,
$\rho_{\ln(D0)-\Delta E} = 0.97$, $\rho_{\ln(D0)-\Delta V+} = 0.54$, $\rho_{\Delta E-\Delta V+} = 0.73$,

Mn: $\ln(D_0) = -10.51 \pm 2.67$ cm^2/s, $\Delta E = 52083 \pm 6805$ cal/mol, $\Delta V^+ = 0.134 \pm 0.076$ cm^3/mol,
$\rho_{\ln(D0)-\Delta E} = 0.96$, $\rho_{\ln(D0)-\Delta V+} = 0.52$, $\rho_{\Delta E-\Delta V+} = 0.72$.

Based on these values, the errors in the tracer diffusion coefficients $D^*_i(P,T)$ were estimated by performing error propagation to equation (1) including an assumed error of 50 °C for temperature and 1 kbar for pressure to account for the geothermobarometric uncertainty of our eclogite P-T estimate (570 °C, 17 kbar).

In a next step we propagated these D^*_i-errors through the calculation of interdiffusion coefficients, D_{ij}, which make up the composition dependent diffusion matrix **D** (equation 2):

$$D_{ij} = D_i^* \delta_{ij} - \left(\frac{D_i^* z_i z_j C_i}{\sum_{k=1}^{n} z_k^2 C_k D_k^*} \right) (D_j^* - D_n^*) \quad (2)$$

(including an error of 0.01 in mole fractions of garnet endmembers; δ_{ij} is the Kronecker delta, z_i (z_j) is the charge on the i^{th} (j^{th}) component whose composition is C_i (C_j), and component n is the dependent component). The final errors in EBDCs were computed by propagating these D_{ij}-errors through equations of the type shown for Fe in the following equation (3) including an assumed error of 0.05 for the nonideal part of the EBDC:

$$D_{Fe(EBDC)} = D_{FeFe} + D_{FeMg}\,\partial C_{Mg}/\partial C_{Fe} + D_{FeMn}\,\partial C_{Mn}/\partial C_{Fe}$$

EBDC's used in analytical (one-dimensional) diffusion modelling via the equation

$$C_i(t,x) = C_i(0) + C^0_i/2\ \{1 - \mathrm{erf}(x/(\sqrt{4 D_{i(EBDC)} t}))\} \quad (4)$$

(where t = time , x = distance, $C_i(0)$ is the lower of the two initial values of C_i and C^0_i is the initial concentration difference between the two sides of the couple), then have typical errors of 0.3-0.5 log-units. By varying the EBDC´s of Fe and Mn within 2σ we found combinations of EBDCs that resulted in best matches of calculated and measured diffusion profiles for **single** time values (consistent for Fe and Mn), and we were able to derive a maximal time of diffusion possible within the error range of EBDCs.

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Die dynamische Entwicklung des Wiener Beckens: vom Miozän zur Gegenwart

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Die krustenmaßstäbliche Pull-Apart-Struktur des Wiener Beckens entwickelt sich während des Miozäns an einer sinistralen Transferstörung, die vom Mur-Mürztal über das Wiener Becken bis in die Westkarpaten Galiziens kartiert ist. Die Störung bildet die NW Begrenzung einer Fluchtscholle, die aus der Konvergenzzone der Ostalpen nach NE entkommt. Die Transferstörung ist mit NE-gerichteten Überschiebungen an der Front der Fluchtscholle in den äußeren Karpaten verbunden. Die Verbindung mit diesen Überschiebungen, die Subsidenzgeschichte des Pull-Apart-Beckens, die nur mit einem Abscherungshorizont an der Basisüberschiebung der alpin-karpatischen Decken erklärbar ist, und die thermische Entwicklung des Beckens belegen eine "thin-skinned" Entwicklung des Beckens.

Die Lage von Erdbebenepizentren, GPS-Messungen, Rezentspannungen, geomorphologische Daten und detaillierte Kartierungen aktiver Störungen im Wiener Becken lassen darauf schließen, dass die rezenten tektonischen Prozesse gut mit den miozänen vergleichbar sind. Daten von seismisch und tektonisch aktiven Störungen aus dem Wiener Becken belegen, dass

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 Verkippung 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*(H_2O) 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*(H_2O). 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*(H_2O) 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*(H_2O) 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 + aluminumsilicate + 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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