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Petrology of low pressure granulites from the Lichtenberg and Sauwald zone, Bohemian Massif, Upper Austria

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The Bohemian Massif in Upper Austria exposes low pressure granulite facies rocks which belong to the Moldanubian Unit and were metamorphosed during the last stage of the Variscan orogeny. The investigated Lichtenberg (northwest of Linz) and Sauwald (south of the river Danube) zones comprise mainly paragneisses. However, most of these rocks underwent high degrees of melting forming meta- and diatexites ("Perlgneise"). Al-rich metapelites, which are suitable for precise PT and PT-path determinations, can be found in various localities throughout the whole unit. In this study samples from the cliffs along the Danube valley between Linz and Wilhering and from Werndorf (close to Schärding) were sampled and investigated petrographically in detail. Since garnets are rare and usually consumed by cordierite, a sample with unusual large garnets was of special interest. A chemical zoning profile across the diameter of the c. 1cm large garnet showed an elevated Ca-plateau (Xgrs=0.06) in the core which decreased discontinuously towards the rim to Xgrs=0.02. Almandine, pyrope and spessartine components do not show any pronounced zoning pattern. Most of the smaller garnet grains in other samples are also homogeneous in composition with a slight Xalm increase and Xprp decrease at the rims, typical for retrograde diffusional zoning.

The migmatic gneisses and cordierite–garnet–sillimanite–granulites as well as mafic granulites were used for geothermobarometric calculations. Metamorphic conditions of around 770°C to 850°C and 0.5–0.6 GPa could be obtained, which are similar to the values obtained by Tropper et al. (2006).

P. Tropper I. Deibl F. Finger R. Kaindl (2006). P–T–t evolution of spinel–cordierite–garnet gneisses from the Sauwald Zone (Southern Bohemian Massif, Upper Austria): is there evidence for two independent late-Variscan low-P / high-T events in the Moldanubian Unit? Int J Earth Sci (Geol Rundsch) (2006) 95: 1019–1037.