

HIGH PRESSURE GRANULITES FROM THE SOUTHEASTERN MARGIN OF THE BOHEMIAN MASSIF, AUSTRIA

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High pressure granulites play a key role in the geodynamic reconstruction of deep subducted or overthickened continental crust. One of the most spectacular areas to study such enigmatic rocks is the southeastern margin of the Bohemian Massif (BM) in Lower Austria, close to the River Danube. There, the BM is occupied by the high grade Gföhl Nappe System of the Moldanubian Zone which exposes predominately fresh leucocratic granulites accompanied by subordinate amounts of mesocratic pyroxene bearing granulites in its uppermost position. Both granulite types outcrop in locally separated massifs which, from south to north, are the Pöchlarn-Wieselburg, the Dunkelsteinerwald and Zöbing massifs. Ultra high temperature (UHT) conditions of 950-1150°C and 20-22kbar have been calculated from leucocratic granulites comprising the mineral assemblage quartz + ternary feldspar (now mesoperthitic K-feldspar) + garnet + kyanite + rutile (Fig.1A). Garnet zoning profiles display a distinct grossular plateau with high X_{Grs} values of about 0.3, in contrast to values of about 0.05 at the outermost rim (Fig. 1B). The pronounced zoning in garnet indicates that the UHT event must have been short lived since diffusion in this temperature region is usually sufficient fast to homogenize any prograde zoning pattern. However, the homogeneous cores might also be interpreted as the result of homogenization and the zoning pattern at the rims is the result of an additional growth phase which is obscured by additional diffusional processes. The general mineral assemblage of mesocratic pyroxene bearing granulites consists of quartz + mesoantiperthitic plagioclase + orthopyroxene + garnet. The presence of orthopyroxene and the lack of clinopyroxene, indicates reequilibration at medium pressure where orthopyroxene forms after garnet, clinopyroxene and quartz (e.g. GREEN & RINGWOOD, 1967).

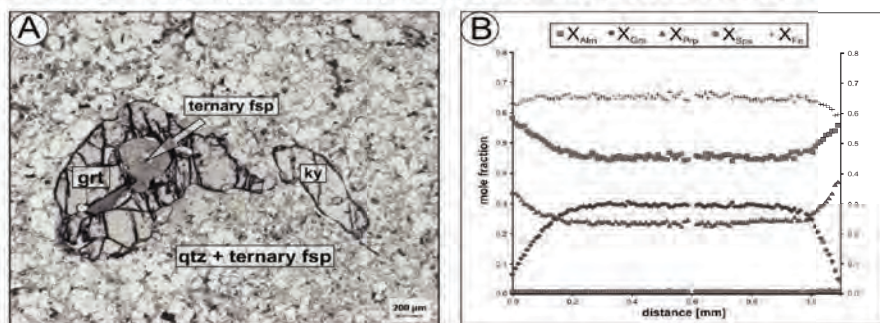


Figure 1. (A) High pressure mineral assemblage of leucocratic granulites from the Dunkelsteiner Wald Massif and (B) Garnet profile with grossular plateau indicating high pressure metamorphic conditions for core growth.