the core. SHRIMP II analyses of both zircon domains at Curtin University, Perth WA, (for analytical conditions see Massonne et al., 2007) yielded the following results: A) mean of 12 core analyses: 278 ppm U, 187 ppm Th, 342.0 ± 2.4 (95% confidence level) Ma and B) mean of 12 rim analyses: 71 ppm U, 24 ppm Th, 337.1 ±4.8 (95% confidence level) Ma. Thus, zircon from sample E03-14 is as old as that from saidenbachite (see above). Interestingly, the occurrence of former K-cymrite from inclusions of K-feldspar-quartz intergrowths in garnet of eclogite from stop 1-3C was reported by Massonne et al. (2000), but perhaps this feature points instead to melt inclusions, as deduced for similar inclusions in omphacite of eclogite exposed a few kilometres north of the Saidenbach reservoir (stop 1-2).

The composition of phengite in the pegmatoid from stop 1-3C indicates crystallization pressures between 1.5 and 1.8 GPa at temperatures between 700 °C and 750 °C (Massonne and Bautsch, 2004). This pressure interval also applies to the late matrix stage of the eclogite, at which potassic white mica and biotite coexist (see Fig. 21). Again, the P-T conditions of this late metamorphic stage are very similar to that derived for stage III in eclogite E99-24. In addition, the composition of the extended garnet core in sample E42-1d is as rich in Ca (Table 8) as that of eclogite E99-24. In fact, the Mg content of the garnet core (Table 8) is lower than that of E99-24 but the Mg content (as well as the Mg/Fe ratio) of the bulk rock of E42-1d is also significantly lower than that of E99-24. It is thus conceivable that eclogites from stops 1-3A and 1-3C and, consequently, from the entire northern and eastern portion of the Saidenbach reservoir and its vicinity have experienced a similar P-T evolution, as shown in Fig. 14. Furthermore, the P-T evolution of saidenbachite is similar. Thus, it is conceivable that the eclogite exposed at stop 1-3C was also partially molten, as was the protolith of saidenbachite. This idea arises from the homogeneous and similar distribution of garnet in both eclogite and saidenbachite from several bodies at and near the Saidenbach reservoir. Possibly, the granitic melts appearing in schlieren and pegmatoid dykes at stop 1-3C represent remaining melts of the postulated melting (and crystallization) at UHP conditions. However, external melts, derived from the adjacent migmatitic country rocks, could have produced the whitish schlieren, as well. Contrary to the invoked melting of basic material at UHP, the carbonate (-rich?) eclogite(s) at stop 1-3A might not have been molten at UHP, either due to high CO_2 partial pressures or maximum temperatures lower than those experienced by the eclogite type from stop 1-3C.

In addition to the different bulk-rock compositions of eclogites at the Saidenbach reservoir compared to those from elsewhere in the Saxonian Erzgebirge, the peak temperatures of the Saidenbach eclogites were significantly higher (at least 1000 °C), compared to those of other areas in the central Erzgebirge. For the latter eclogite group, peak temperatures between 730 °C and 840 °C and around 850 °C (see Fig. 8G) were reported by Massonne (1994) and Schmädicke et al. (1992), respectively. In addition, Zack and Luvizottow (2006) estimated peak temperatures of 850 °C at 3.5 GPa for an eclogite occurrence a few kilometres north of the Saidenbach reservoir. However, these temperature estimates are very likely too high, because the pressures were significantly overestimated, as demonstrated by the new determination of metamorphic P-T conditions for eclogite E174c from stop 1-2 (see Fig. 8G).

The chemical bulk rock compositions of eclogites at stop 1-3C are somewhat variable (see the three analyses in Table 2), despite their similar aspect in the field. Massonne and Czambor (2007) concluded on the basis of trace-element signatures that the protoliths of these eclogites were possibly within-plate igneous rocks, similar to the eclogites at stop 1-3A (see above). These authors previously suggested that these rocks were formed by melting of crustal material in the deep mantle. However, if the protoliths of eclogites from the northern and eastern portion of the Saidenbach reservoir were once (marly) sediments, the relatively high bulk-rock contents of V, Cr, and Ni (see Table 2) would be unexpected. On the other hand, such relatively high contents of the transition metals could be due to minor interaction with mantle material during the melting and crystallization processes in the deep mantle.

Stop 1-3 – D (Day 1). Layered Granulitic Gneiss, Former Small Quarry

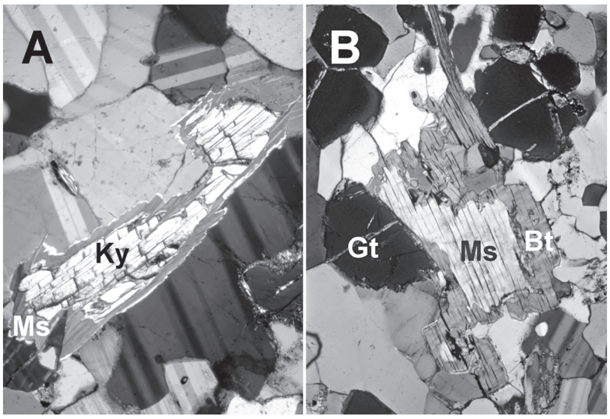
Coordinates: N50°43′41.4″ E13°14′49.0″

Continue to walk along the shore of the Saidenbach reservoir in a south-easterly direction. After walking ca. 400 metre another natural exposure of rocks appears (actually a former small quarry before the Saidenbach dam was constructed), which is well recognizable even if the level of the Saidenbach reservoir is at its maximum.

Layered granulitic gneisses crop out at this stop (Fig. 9). Greenish and reddish layers represent more basic *vs.* more acidic rock compositions, respectively. All different rock types at this stop contain abundant up to mm-sized garnet, potassic white mica and biotite. Biotite tends to be a late stage phase, replacing potassic white mica (Fig. 22). Kyanite occurs in some layers, but is commonly replaced by potassic white mica (Fig. 22).

Omphacite was formerly present in the greenish layers, but is now entirely transformed to symplectites of plagioclase, amphibole, and Na-poor clinopyroxene. The same feature is also discernible in some reddish layers although the ratio of amphibole + Na-poor clinopyroxene to plagioclase is significantly lower compared to that in the greenish layers. This contrast is explained by a higher jadeite content in former clinopyroxene in the reddish layers compared to that in the greenish layers. Locally, in these gneisses a few, mm-thick garnet-rich layers alternate with layers consisting almost exclusively of quartz, plagioclase and subordinate K-feldspar.

Peak P-T conditions for the granulitic gneisses were reported by Willner et al. (1997) to be as high as 2.0 GPa and 800 °C with no indications of higher pressure. The rocks at stop 1-3D might again represent eclogitized crustal material formed at the base of crust thickened by the Variscan orogeny. Whether this thickening event happened 340 Ma ago, indicated by U-Pb dating of zircon (Kröner and Willner, 1998), or earlier, is still unclear. In spite of the observed eclogitization, the rocks from stop 1-3D do not seem to have been more deeply buried than 70 km (2.0 GPa), whereas other rocks in the area (see stop 1-3A and B) have experienced UHP conditions, explained by the aforementioned delamination process.



■ **Fig. 22.** Photomicrographs of metapelitic sample E42/1b (stop 1-3D) under crossed nicols, taken from Massonne and Bautsch (2004). A) Kyanite (Ky) relic marginally replaced by potassic white mica (Ms). Image width is 650 µm. B) Phengitic muscovite (Ms) marginally replaced by biotite (Bt). Gt = garnet. Image width is 850 µm.

Alternative Stop 1-3 – E (Day 1). Saidenbachite in the Forest

Coordinates: N50 43′41.8″ E13 15′15.0″

Continue to walk to the east for somewhat more than 1 km along the shore of the reservoir and the pre-reservoirs until reaching the village of Forchheim and subsequently the national road B 101 and turn to the south-west to see immediately the parked vehicle and/or the manor house of Forchheim. Alternatively, walk towards the hill top and find blocks of saidenbachite, occurring along the slope in the forest, after ca. 400 to 500 m of walking (see Fig. 9). These saidenbachite blocks at alternative stop 1-3E are virtually identical to those at stop 1-3B. From stop 1-3E walk downhill to return to the forest road along the shore of the Saidenbach reservoir to continue to the parked vehicle as described above. Afterwards, go back to Marienberg and stay overnight, for instance, in Hotel Weisses Ross.

This hotel is located at the margin of the historical town of Marienberg, which was founded by Duke Henry IV, the Pious, of Saxony in 1521 due to the discovery of silver-bearing ores in the vicinity. The old town emerged from the planning stage as a unique Renaissance town north of the Alps, following a rectangular plan. The portal of the town hall from the year 1539 is a relic from this time.