Chlorite–Quartz–Calcite veinlets occur along younger faults which are displacing the alteration fronts. Wallrock alteration dos not occur. Chlorite grew from both sides of the fault plane towards the center. The growth of chlorite was followed by the growth of quartz. Calcite is the last stage and fills the open spaces.

If the lithostatic pressure was around 1 kbar the **matrix chlorites** would have formed at a temperature of around 300 °C under reducing conditions. At a pressure of 1 kbar the chemical composition of vein chlorites point to a formation temperature of around 250 °C and reducing conditions, too.

Hydrothermal fluids I (Permian)
The 'Graben of Malmedy' is bound by northeast–southwest trending and southeast dipping extensional faults. Small quartz veins and quartz lenses occur along the fault planes. These quartz veins are often irregular in shape. Several stages of brecciation and rehealing of the quartz veins and lenses occur.

Hydrothermal fluids II (Postpermian – Prequaternary)
Two NE–SW trending lead–zinc districts occur in the northern part of the Linksrheinisches Schiefergebirge:
- the Namur–Lüttich–Kerkrade–Stolberg district
- the Wampach–Bleialf Rescheid district.

In general the veins are following NNW–SSE trending faults of Postvariscian age. The **temperature** of the mineralizing fluids have been between 80 °C – 200 °C with maxima at 100 °C, 180 °C, 200 °C. Maxima of the salinity are at 6, 14 and 22.3 wt.% NaCl equiv. $CaCl_2$ and NaCl are the main components of the fluids. The **gas phase** is characterized by the occurrence of CH_4 (Redecke 1992).

Hydrothermal fluids III (recent)
At the surface this fluid system which is still active occurs around Aachen. Migration pathways are the Aachen thrustfault and the limestones of Lower Upper Devonian age (Langguth & Plum, 1984). The surface temperatures variies between 47 °C and 70 °C. The main ion concentration is >4000 mg/l with 33% Na^+, 2% K^+, 1% Ca^+, 38% Cl^-, 19% HCO_3^- and 7% SO_4^{2-}. The **gas composition** (vol. %) is characterized by 77.6% N_2,18% O_2+Ar, 3.5% CO_2, 0.04% H_2S and 0.9% C_mH_n.

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THE SOUTH KRKONOŠE MOUNTAINS: SAXOTHURINGIAN/MOLDANUBIAN BOUNDARY IN THE CZECH SUDETES?

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Large–scale tectonic correlations and the occurrence of blueschists (Guiraud & Burg, 1984) make the South Krkonoše Mts. a possible candidate for the Saxothuringian/Moldanubian plate boundary in the western Sudetes. Geological investigations are being crried out in an area set between the Carboniferous Krkonoše granite to the north and the Intrasudetic basin to the south. The structural record proposed in the geological map of Chaloupský (1989) postulates four angular unconformities in pre–Cambrian and Palaeozoic rocks. Therefore, our project combines biostratigraphic (palynomorphs), geochronological and structural studies. Field work is centered upon coherent outcrops in the Úpa,

Labe, Jizerka, Jizera and Kamenice Rivers cutting across the EW-oriented structural grain.

The area is made up of a **lithological sequence** dominated by quartz-rich siliciclastic rocks (quartzites, quartz-sericite mica schists, phyllites, meta-conglomerates), rare arcosic gneisses, and intercalations of meta-cherts, black shales, calcschists and marbles. Basic to felsic metavolcanic rocks occur mainly, but not exclusively, around Železný Brod. Rare finds of fossils summarized in Chlupáč (1993) prove the presence of Cambro-Ordovician and Silurian in this sequence. A higher structural unit contains granitoids, transposed into granite gneisses, augen-gneisses or meta-porphyroids. The granitoids probably correspond to the Rumburk granite and Izera gneiss on the north flank of the Krkonoše granite which have been dated at c. 500 Ma (Rb-Sr WR, Borkowska et al. 1980, U-Pb zircon, Korytowski et al. 1993, Oliver et al. 1993). Dating of the rocks to the south of the granite is in progress.Together with the Proterozoic of the Lausitz, these rocks probably represent Saxothuringian parautochthon. The palaeogeographic affinities of the underlying metasediments and volcanics is at present unknown; correlation with the Barrandian Palaeozoic is plausible yet unproven.

Preliminary results of our field studies indicate **three phases of ductile deformation**, with non-coaxial folds and foliations producing complex interference patterns. The oldest deformation recognized (D1) is seen in relics of isoclinal intrafolial folding of quartz ribbons or of sedimentary bedding. D2 produced the main penetrative foliation. D2 folds are tight to isoclinal, trending east-west, dipping mainly to the East and vergeing to the north. Associated with D2, there is a prominent mineral lineation parallel with the fold axes; there is no persistent asymmetry of clasts. D3 is represented by open folds with mainly south dipping axes. The result at map scale is a very complex fold structure with large syn- and antiforms. Later increments of deformation under brittle pT-conditions are documented by kink bands in phyllites, followed by normal faults, relating to the formation of the Permo-Carboniferous Intra-sudetic basin.

Metamorphism never exceeded the low grade with almandine and biotite. Blue amphibole (recording 6-8 kbars after Guiraud & Burg 1984) has - until now - only been found in the metabasites in the southern part of the study area. Strain (and possibly also the metamorphic grade) increase gradually toward the north. All rocks have been affected by a strong retrogression under low-pressure greenschist facies conditions (albite, chlorite, epidote etc.) Blastesis of albite is syn- to postkinematic in relation to the penetrative D2 foliation.

As investigations are just on their way, no final conclusions can be drawn. It appears that there is one coherent lithological succession (probably a tectonic sequence) in all the area, from the Krkonoše granite to the north down to the brittle contact of the Permocarboniferous Krkonoše piedmont basin to the south. We have not found any indication of an angular unconformity within this sequence; the metaconglomerates are not transgressive, but concordant intercalations within clastic sequences. Apart from differences controlled by lithology, all rocks appear to have undergone the same deformational history. These findings contradict the poly-orogenic tectonic model proposed by Chaloupský and confirm the views of Chlupáč (1993), who considers the tectonometamorphic events as Variscan.

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