

NEW ECLOGITES IN THE SUDETES MTS.

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Recently, in the Western Sudetes, Poland, NE margin of the Bohemian Massif, eclogites have been found which are situated farthest to the east within the Saxothuringian Zone. The Western Sudetes area displays a mosaic composed of several sutured metamorphic blocks stitched with Variscan granites.

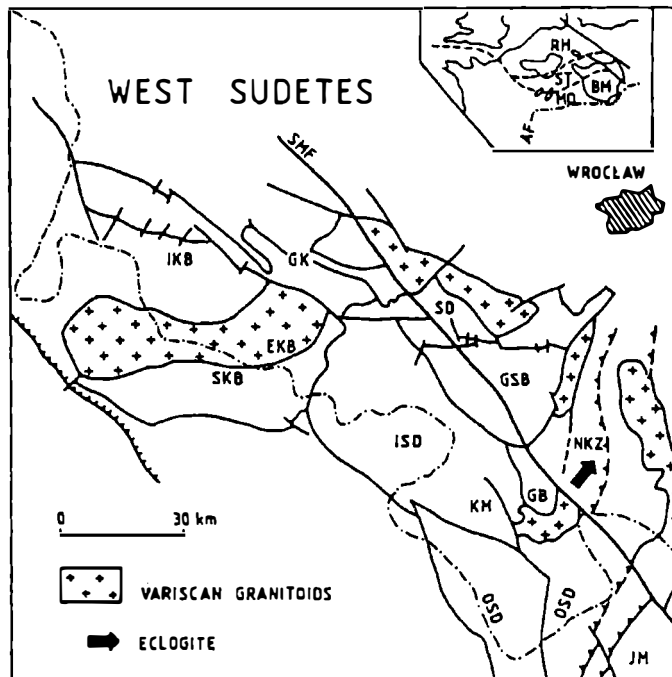


Fig. 1: Geological sketch of the Western Sudetes. EKB=East Karkonosze; GB=Góry Bardzkie; GSB=Góry Sowie block; IKB=Izera-Karkonosze block; ISD = Intra -Sudetic depression; JM = Jeseník Massif; KM = Kłodzko metamorphic unit; NKZ = Niemcza-Kamieniec Zabkowicki mica schist zone; OSD = Orlica-Snieżnik dome; SD = Swiebodzice depression; SKB = South Karkonosze block; SMF = Sudetic marginal fault. Inset map shows the European Variscan belt. AF - Alpine front; BM - Bohemian Massif; MO - Moldanubian Zone; RH - Renohercynian Zone; ST - Saxothuringian Zone.

The eclogites form small lensoid bodies within the Niemcza-Kamieniec-Zabkowicki-schist zone (NKZ, Fig. 1). They contain the primary mineral assemblage of garnet-omphacite-rutile. Retrogression to amphibolite-facies assemblage containing blue-green hornblende-plagioclase-(clinozoisite) is frequent. The country rocks include metapelites (which are now garnet-kyanite-mica schist) and meta-acidites: plagioclase-quartz gneisses with pseudomorphs of plagioclase + haematite after Na-pyroxene.

Preliminary data show the peak conditions for eclogite stage T = 600° - 650 °C and P in excess of 15 kbar. Geochemical analyses indicate that a protolith of the eclogite has probably P-MORB characteristics. There are some textural evidence for a possible gabbroic protolith rock. The eclogites and the country rocks which had been developed during HP deformation within the Saxothuringian Zone, were later reworked by thrusting connected with the stacking over the Moravo-Silesicum.

RESULTS OF THE MAGNETOTELLURIC AND AUDIOMAGNETOTELLURIC MEASUREMENTS ALONG THE MESSERN ARC

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At the endpoints of the seismic profile "Messern-Rothweinsdorf" deep magnetotelluric (MT) soundings and along the profile audiomagnetotelluric (AMT) soundings have been carried out at 12 sites. Their first goal has been to study the distribution of the electric resistivity of the different rocks and secondly to search for correlation between the resistivity and seismic reflectivity values. The combined AMT and MT measurements (with periods from 3000 s to 1/2300 s) show in Messern a definite resistivity decrease (inversion) to 2 - 25 Ωm at a depth of 1300 m. This inversion may hint a lower boundary horizon of the Bittescher Gneis (400 - 3000 Ωm) outcropping here. The very low resistivity values (inversion) are certainly caused by pyrite or graphite bearing phyllitic micaschists covering the Bittescher Gneis. These results are consistent with the seismic ones. The thickness of the well conducting zone has been estimated to some kms. Below, a resistive layer appears in the vertical resistivity section of Messern and it ends in a definite resistivity inversion with some Ωm at the depth of 130 km. In this depth range the top of the low resistivity asthenosphere is suspected.

At the western end of the profile (in Rothweinsdorf) the resistivity distribution is different. The conducting layer appears at the shallower depth of 300 - 400 m. The resistive half space with some thousands Ωm begins from 2 - 2.5 km. The