DRY HIGH-TEMPERATURE SHEARING IN THE FOSSIL HERCYNIAN LOWER CRUST OF CALABRIA (S.ITALY)

1ALTENBERGER, UWE & 2KRUHL, JOERN H. 1Institut fuer Geowissenschaften, Univ. Potsdam, D-14415 Potsdam, Germany; 2Institut fuer Geologie, Geotechnik und Bauwesen, TU Muenchen, D-80290 Muenchen, Germany

In the Hercynian lower crust of Calabria post-Hercynian shearing occurred during retrograde amphibolite to sub-greenschist facies conditions and was concentrated in locally only mm-cm thick shear zones. With the aid of (i) petrological and microstructure-based thermobarometry, (ii) textural analyses, and (iii) infra-red spectroscopy, the timing, P-T conditions and kinematics of shearing are exemplified: (i) The general top-to-the-NW transport of the lower crustal section is reflected by the shear zone. (ii) A period of annealing is bracketed by a stage of high-temperature and a stage of low-temperature shearing. (iii) Even in ultramylonitic layers and in the greenschist facies, shearing occurred under dry conditions. (iv) After the first formation of a shear zone the concentration and continuation of movements is not necessarily governed by the infiltration of fluids but by the presence of a texturally week zone. (v) Despite the general problems of exchange-reaction-based thermobarometry in shear zones, in specific cases reliable results may be obtained. (vi) Shearing along the mm-cm thick shear zone was active over a period of approximately 60 million years. The presented example indicates the extreme stability of even small-scale shear zones during geologically long periods and its usefulness in analyzing the tectonometamorphic histories of crustal segments.