ultramafic-hosted scattered-grain-ophimagnesites (SGOM, CO_2 yielded by decomposition of SGOM varies from 0.02 to 2.57 wt. %) and $\delta^{13}C$ (-15.99 to -1.17‰) increase and $\delta^{18}O_{SMOW}$ (6.24‰ to 25.81‰) decreases towards the centre of the G-J. These relationships possibly result from progressive precipitation of ^{13}C-poor magnesite and ^{18}O-rich serpentine minerals from external serpentinizing solutions and/or from supersaturation of that solution with CO_2 released from fluid inclusion from primary minerals of peridotite. The higher w/r ratios in the marginal parts of the GJ correlate well with structural features of the serpentinite. On the other hand, the highest $\delta^{13}C_{PDB}$ values may also result from precipitation of oceanic carbonates. This could be in agreement with NR carbonates, where the $\delta^{13}C_{PDB}$ varies in the range of -8.60 to -1.56 ‰, and the $\delta_{18OSMOW}$ values range from 12.62 to 16.80 ‰. The highest $\delta^{13}C_{PDB}$ was found in a small vein in pillow lavas, which is consistent with the assumption on a signifficant role of oceanic water in the alteration of the rocks under study. On the other hand, no correlation in $\delta^{13}C$ - $\delta^{18}O$ system was observed (Fig. 2 and 3). Moreover, in contrast to isotope values in vein magnesites from the Lower Silesian ophiolites, the transect in one 1-m wide calcite vein, oxygen isotope ratios vary much more widely than carbon isotope ratios. This may suggest that neither the temperatures nor compositions of carbon and oxygen in the mineralising fluids dominated the isotope composition of this system during the formation of thick calcite veins, but rather the most significant factor was the low temperature disequilibrium processes. On the other hand, the high $\delta^{13}C_{PDB}$ = -1.56 ‰ and $\delta^{18}O_{SMOW}$ = 16.5 ‰ of vein magnesite may suggest substantial contribution of oceanic DIC during oceanic stage of these complex and a temperature of about 110 °C for this calcite precipitation. This temperature corresponds very well to the temperature of precipitation of sulphides in the WH amphibolites.

Finally, one or two generations of oxide minerals in mafic member of the SI (magmatic and high-temperature metamorphic?), two generations of sulphide deposits (oceanic-hydrothermal and continental-hydrothermal) and 4 generations of carbonates (oceanic, continental metamorphism, contact-hydrothermal and weathering) were evidenced due to the presented results of isotope analyses.

Deformation in Front of Obliquely Moving Rigid Body

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In nature, zones accumulating transcurrent deformation are usually relatively narrow in comparison to zones exhibiting frontal deformation. We develop a model of deformation in front of obliquely moving rigid indenter producing such strain partitioning. We use two previous concepts of the deformation in a ductile viscous zone. First, approximate solutions for the velocities in the interior of a viscous sheet deformed by an indenter (England et al. 1985) show that the deformation across the zone decreases exponentially with the distance from the indenter and the transcurrent deformation has higher attenuation factor than the compressional deformation. Second, similarly as in the models of oblique transpression (Tikoff and Teyssier 1984; Thompson et al. 1997), we consider the velocity of the indenter to be split in the components parallel and perpendicular to the indenter and depending on the angle of collision. To describe deformation history in front of the indenter we consider a rock sample in the deformed zone and compute its relative velocity with respect to the approaching indenter. As the velocity of the ductile material is always lower than the velocity of the indenter, the distance of the sample to the indenter is progressively shortened. For the considered rock sample we compute temporal development of finite strain parameters – strain intensity, strain symmetry, lineation and foliation.

The model typically produces a short domain near the indenter with prevailing tangential strain followed by a wide zone dominated by compressional strain. We develop a formula expressing the distance at which the strain rate for the tangential strain rate and the compressional rate equal each other,

$$y = \frac{2L \ln[4 \cot g(\alpha)]}{3\pi\sqrt{n}},$$

where α is the angle of collision (0° for parallel and 90° for perpendicular motion), n power law exponent and L is the length of the indenter. Below this distance, instantaneous shearing parallel to the indenter boundary prevails over compression. However, from the point of finite deformation, the domain observed as dominated by simple shear is much thinner due to the more effective accumulation of pure shear type of deformation. Most interesting features of the model occur for a very oblique collision. In such case it is generally accepted that the tangential strain rate is higher than the compressional one for low angles of collision and produces horizontal lineation. Tikoff and Teyssier (1984) show that in the Sanderson's (1984) model of transpression such effect is possible for the angle of obliquity $\alpha < 20°$. In contrast to this, our model exhibits stepwise transition from horizontal to vertical lineation across the domain and it can produce horizontal lineations for angles $\alpha < 20°$.

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