P12. The role of shear zones in the tectono-metamorphic evolution of the lithosphere: insights from microfabric to mountain belt structures

SYN-SHEARING MOBILITY OF MAJOR ELEMENTS IN DUCTILE SHEAR ZONES: STATE OF THE ART FOR FELSIC DEFORMED PROTOLITHS

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The mineralogy of ductilely sheared rocks is controlled by the bulk rock composition of the protolith, together with the P-T conditions of shearing. However, the mineral assemblages of shear zones acting as open system may be strongly influenced by the occurrence of mass transfer processes induced by channeling H_2O-rich fluids and mobilizing major elements. Major element mobility is also related to the fluid chemistry, which can be affected by the fluid source location, i.e. the shear zone host-rocks or the shear zone far-field. Recent case studies suggest that significant whole rock compositional changes occurred within ductile shear zones in response to fluid infiltration from the host-rocks, whereas other case studies show that whole rock compositional changes within ductile shear zones occurred due to infiltration of fluids from far-field sources. To investigate the presence of common features regarding the gain and loss of mobilized major elements with respect to the thermobaric conditions of shearing and the fluid source, a review of literature case studies dealing with felsic sheared protoliths has been undertaken.

Qualitative results suggest high mobility of major elements under greenschist facies conditions whatever the tectonic context. Under compressive tectonics, qualitative outcomes show that Si has the highest mobility whatever the fluid source location and that sheared felsic rocks are always enriched in Mg relative to Fe. Moreover, a preferential gain of Al and Fe with respect to the fluid source is shown.

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