



Arc mantle processes in the ultramafic rocks of Sapat (Kohistan-Pakistan)

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The deepest levels of the Kohistan Paleo-Arc are reportedly exposed in the so-called Jijal section, where the crust-mantle transition, affected by complex melting and recrystallization processes, represents a mature evolution stage of the arc. The Sapat Complex occupies the same structural position, directly above the Indus Suture Zone, about 70 kilometers to the east of Jijal. Owing to difficult access, it is one of the little documented segments of the suture zone. The Sapat Complex exposes ultramafic and mafic rocks that have preserved primary features and, to the contrary of Jijal, have escaped mature stages and recrystallization. This complex is therefore an excellent opportunity to document tectonic and magmatic processes that took place at the front of the Kohistan Arc, and/or during its early evolutionary stages.

The ultramafic rocks consist in a websterite-harzburgite-dunite body. It is 12km long and about 700m thick and likely represents the fore-arc mantle of the Kohistan Arc. The harzburgite and dunite alternate intimately, and websterite is present in several meters thick planar zones. This ultramafic association documents, together with clinopyroxene-rich dykes and veins, a plagioclase bearing-impregnated reactional zone, magma/mantle interactions due to the infiltration of arc-related magma. Gem olivine containing inclusions of borate and antigorite and associated with magnetite and calcite in tension gashes provide evidence for slab-related fluid percolation into the mantle wedge.

We document the structural and petrological characteristics of the Sapat Complex,

which are the necessary background to chemical and geochemical documentation for understanding mantle-wedge processes.