

Petrography and mineral chemistry of metaultramafics in the Austroalpine Siegraben structural complex at Siegraben and Schwarzenbach, Austria

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Abstract

The Siegraben structural complex occupies a middle position (the former Middle Austroalpine Unit) in the Austroalpine basement nappe system in the Eastern Alps. It is reported as a part of the Upper Austroalpine Unit and is located in the Rosalien Mountains between the Siegraben and Schwarzenbach villages (approximately 80 km south of Vienna). Our main goal is to precisely determine the petrography and mineral chemistry of lensoidal metaultramafic bodies in metapelites (micaschists to gneisses, migmatitic gneisses), metabasites (eclogites, amphibolites, metagabbros), impure metacarbonates to calc-silicate rocks (marbles), crosscut by veins of granitic orthogneisses (leucocrate metagranites, metapegmatites) in a pre-Alpine basement complex. Mineral assemblages from representative microstructures of massive to strongly schistose metaultramafics were studied by polarized-light microscopy and mineral chemical compositions were determined by Cameca SX-100 electron microprobe. Part of the metaultramafics preserves a mineral assemblage characterized by a higher content of olivine (forsterite) and orthopyroxene (enstatite) relics from the inferred eclogite facies metamorphic stage (D1). Antigorite, Ca-amphibole (tremolite) and Mg-rich chlorite (1) with chromite as the main matrix in the exhumation amphibolite facies metamorphic stage (D2); and chrysotile, Mg-rich chlorite (2), magnetite, rare talc and carbonates in the greenschist facies metamorphic stage (D3). Clinopyroxene is absent. The studied metaultramafics are mantle fragments emplaced in a subducted continental crust most likely due to the Cretaceous subduction-collision event reported from this basement.

Key words: *Siegraben structural complex, metaultramafics, petrography, mineral chemistry*

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