Antigorite dehydration in silica enriched serpentinite

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In subduction settings, antigorite-talc schist may form during prograde subduction zone metamorphism as a result of chaotically intermixing of ultramafic rocks with metasediments and metabasites in a mélange zone or alternatively as a result of Mg-removal in serpentinites during seawater-alteration at slow-spreading mid-ocean ridges. Talc-schist and talc-bearing serpentinite may hence be common lithologies in subduction settings and will undergo different dehydration reactions that have not been considered so far. Antigorite and talc will react at lower pressure and temperature than the terminal antigorite dehydration producing orthopyroxene and free water. Although this reaction is not expected to be as important in the transfer of water to mantle depth as the breakdown of antigorite, it represents nevertheless a dehydration event in subduction zones. We anticipate that this reaction might be particularly important for the fore-arc mantle wedge.

Piston cylinder experiments on silica enriched serpentinites from the Cerro del Almirez ultramafic complex (Nevado-Filábride Complex, Betic Cordillera, SE Spain) [1] constrain the pressure-temperature conditions for the assemblage Atg + Opx and Atg + Opx + Ol with highly polysomatic ordered (m = 15-16) antigorite with high-Al and Cr contents [2]. The appearance of orthopyroxene in talc-bearing serpentinite is restricted to pressures higher than 1.5 GPa inside the antigorite stability field between 640 and 680°C. The Opx-serpentinite facies is thus helpful in the reconstruction of PT conditions of subducted ultramafic rocks where common serpentinites have no diagnostic assemblage over a large range in PT space.

[1] Trommsdorff, López Sánchez-Vizcaíno, Gómez-Pugnaire & Muntener (1998), *Contrib Mineral Petr* **132** 139-148. [2] Padrón-Navarta, López Sánchez-Vizcaíno, Garrido, Gómez-Pugnaire, Jabaloy, Capitani & Mellini (2008), *Contrib Mineral Petr* **156**, 679-688.

Fluid geochemistry of the shear zone type gold mineralization in northwestern of Sanandaj-Sirjan zone (west of Iran)

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Sanandaj-Sirjan zone is the inner crystalline zone of Zagros orogen, which has been exhumated during Late Cretaceous –Eocene continental collision between Arabian plate and Central Iran.

The geochemistry characteristics of the mineralizing fluids in northwestern of Sanandaj-Sirjan zone are studied based on microthermometric analysis of fluid inclusion from Qolqoleh, Kervian and ghabaghlogeh gold deposits. Main lithologic units of these areas includes Mesozoic rocks were metamorphosed in green schist facies.

The area was affected by NE-SW trending shear zone and subsequert deformation. The main and economical mineralization has been concentrated along normal faults and related brittle shear zones. Gold is intimately disseminated in quartz, but also it is associated with Sulphides, especially Pyrite and chalcopyrite. Four types of fluid inclusion were identified in the studied materials, distinguished by shape, degree of filling of the vacuoles, and phase composition: 1-aqueous 2-monophasic and biphasic containing CO_2 3-aqueous solutions with CO_2 4-aqueous with crystals.

The melting temperature of the carbonic phases ($TmCO_2$) rang from -60.9°C to -57.8°C, indicating CO_2 dominance and presence of other gases such as CH_2 and N_2. Total homogenization temperatures of 180-390°C and a maximum temperature (Td) between 350-400°C Salinity ranges between 2-14 Wt% equivalent .

The isochors of CO_2-H_2O and H_2O-NaCl inclusions suggest an isothermal exhumation path from a depth of ~10-16 km considering a lithostatic condition. The fluid composition, temperature and pressure data are compatible with orogenic-type gold deposits.