The retrograde partial melting of the Xitieshan UHP eclogite from the North Qaidam, NW China

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Felsic veins in UHP rocks represent products of fluid-rock interation and, as such, provide vital information for fluid processes during subduction and exhumation. We present here studies of geochemistry and zircon U-Pb dating of felsic veins in the Xitieshan UHP eclogite, the North Qaidam UHP belt in NW China.

The Xitieshan eclogite, one of the four UHP eclogite terrains in the North Qaidam UHP belt, mainly composite of Grt+Omp+Ru+Q±Phen. Mineral thermobarometer calculation revealed the eclogite experienced UHP metamorphism and the granulite-facies overprint [1, 2]. In the outcrop, some felsic veins were observed within the eclogite. These veins strongly deformed and encircle or cut the deformed eclogite lentoid body. Veins are mainly composed of Pl (60%-70%) and Qtz (30%-40%) with minor of Ms and Bi (<1%). Geochemical analyses show that these veins are trondhjemite with characteristics of high content of SiO_2 (66.92- 78.38%), Al_2O_3 (12.46-20.60%), Na_2O (3.77-6.45%), Sr (347-478 ppm), low content of MgO ($Mg^{\#}$ 0.39-0.47), Y (0.4-6.9 ppm) and Yb (0.02-0.30 ppm), and high ratios of Na_2O/K_2O (6.0-32.3) and Sr/Y (60-1109), which consistent with the equilibrium of the melt with eclogite, the characteristics of Adakite.

Zircon CL imaging and trace element analyses for vein and the host eclogite show that zircon grains from the veins have perfect euhedral shape with oscillatory zoning internal structure, very low Th/U ratios and REE patterns of steep HREE with negative Eu abnormity, indicating their direct crystallization from the veins. Zircons from the host eclogite have rounded shape without any intrenal structure, low Th/U ratios, flat REE parterns without any Eu abnormity, typical of eclogite-facies zircon. LA-ICP-MS *in situ* dating yield $^{206}Pb/^{238}U$ age of 428.3±1.7 Ma for the vein formation, 458±3Ma and >730Ma for peak metamorphic and protolith age, respectively for the host eclogite. Combined with the geochemical features and occurrence of veins, suggest that the felsic veins in the Xitieshan UHP eclogite were formed by partial melting of the eclogite during the exhumation.

[1] Zhang J *et al*. (2005) Lithos **84**, 51–76. [2] Zhang C *et al*. (2009) in 8th Int. Eclogite Conf. Aug. 25-Sept. **3**, Xining, China, Abstr. 169–170.

Zinc interaction with glucosamine-functionalized fused silica/water interfaces at pH 7 and 10 mM NaCl studied by second harmonic and vibrational sum frequency generation

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The interaction of zinc cations with sugar displays at aqueous/solid interfaces is important for biological and geochemical processes. Here, we show how vibrational sum frequency generation, x-ray photoelectron spectroscopy, and the Eisenthal chi (3) method provides quantitative structural, thermodynamic, and electrostatic information for determining the absolute surface coverages, free energies of binding, and the binding constants for the reversible interaction of Zn^{2+} with glucosamine-functionalized fused silica surfaces. The results are discussed in the context of molecular recognition and signaling.