Geophysical Research Abstracts
Vol. 16, EGU2014-15553, 2014
EGU General Assembly 2014

Mineralogy of the Santa Fe Tin deposit, Bolivia

Abigail Jiménez-Franco (1), Pura Alfonso (1), Carles Canet (2), Maite Garcia-Valles (3), and Juan Elvys Trujillo (4)

(1) Dept. d'Enginyeria Minera i recursos Naturals. universitat Politècnica de Catalunya, Manresa, Spain (celenus83@gmail.com), (2) Instituto de Geofísica, Universidad Nacional Autónoma de México, Ciudad Universitaria, Delegación Coyoacán, 04510 Mexico D.F., Mexico (ccanet@geofisica.unam.mx), (3) Dpt. Cristal·lografia, Mineralogia i Dipòsits Minerals, Universitat de Barcelona, c/ Martí i Franquès, s/n, 08028 Barcelona, Spain (maitegarciavalles@ub.edu) , (4) Facultad Nacional de Ingenieria, Universidad Técnica de Oruro, Oruro, Bolivia (jelvyst20@gmail.com)

Santa Fe is a Sn-Zn-Pb-Ag ore deposit located in the Oruro district, Central Andean Tin Belt, Bolivia. Mineralization occurs in veins and disseminations. It is hosted in Silurian shales and greywackes. The sedimentary sequence is folded and unconformably covered by a volcanic complex of the Morococala Formation, mainly constituted by tuffs of Miocene age. A wide Nº40 shear zone and two systems of fracture are developed. A Nº40 fracture system, dipping 60ºW, which hosts Sn and Zn minerals, and other in the same direction but dipping 75ºE, which is related to Zn-Pb-Ag veins. The mineralization is associated to intrusive felsic magmatism. Although there are not intrusive rocks in Santa Fe, a dyke and the felsic San Pablo stock occur at a distance of about 10 km.

In the present work we describe the geology and mineralogy of the Santa Fe deposit. X-ray diffraction, scanning electron microscopy and electron microprobe analyses were used to characterize the minerals.

Veins are filled with quartz and an ore mineral assemblage of cassiterite, sulfides and sulfosalts. Cassiterite constitutes the earliest formed mineralization. Preliminar microprobe analyses indicate that it is nearly pure, with negligible contents in Nb and Ta. Rutile occurs as a late phase associated with a late generation of cassiterite. It forms thin neddle-like crystals.

In addition, Sn is also present in sulfides as stannite, stannoidite and këwhile. Other sulfides are pyrrhotite, pyrite, arsenopyrite, galena, sphalerite, marchasite and argentite. Bismuthinite and berndite are found nin trace amounts. Sulfosalts include tetrahedrite, myarhyrite, boulangerite, jamesonite, franckeite, zinckenite, cilindrite and andorite.

Associated with the mineralization, several phosphate minerals are found filling cavities and small fractures. The most abundant are monacite (Ce,La,Nd,Th)PO4 and plumbogummite (PbAl3(PO4)2(OH)5•(H_2O)). Crandallite CaAl3(PO4)2(OH)5•(H_2O) and vivianite (Fe3+(PO4)2•8(H_2O)) also occur in minor amounts.

The alteration is usually volumetrically important between the host rock and veins. The most abundant alteration minerals are sericite alunite, plumbojarosite, kaolinite, vermiculite and dickite.