Occurrence of Ge-bearing accessory minerals within the Variscan Pb-Zn deposits of the Bossost dome, French Pyrenean Axial Zone

A. CUGERONE[1], B. CENKI-TOK[1], A. CHAUVET[1], E. LE GOFF[2], L. BAILLY[2], O. ALARD[1], E. OLIOT[1], ALARD M.[1]

[1] Géosciences Montpellier, 34095, Université Montpellier, France

[2] BRGM, Bureau de Recherches Géologiques et Minières, 45060 Orléans, France

Germanium is a critical metal used in the optical, catalyse and photovoltaic industry. In the variscan Pyrenean Axial Zone (PAZ), the presence of Ge-bearing accessory minerals (up to 70%wt Ge) is widespread in Pb-Zn deposits. However this mode of occurrence is rare: Ge generally occurs in trace content in sulphides like sphalerite (< 3200 ppm) or in coal deposits (<5500 ppm).

We have studied the micro and macro-structures as well as the petrology, mineralogy and chemistry of three Pb-Zn deposits located in Late Ordovician rocks within the Bossost dome. These rocks are mainly deformed by E-W trending folds and a regional S2 cleavage which hosts the late mineralised veins. Variscan deformation and mineralization are associated to a regional low grade metamorphism. LA-ICP-MS *in-situ* analyses on recrystallized/deformed sphalerite, and brunogeierite ($GeFe_2O_4$) show a depletion in Ge and other trace-elements (e.g. Ga, Cu) in sphalerite and an enrichment of these elements in brunogeierite. The comparison with others Ge-deposits in the world shows that occurrences of Ge-minerals is similar to Kipushi-type deposits which could represent an analogue for the PAZ deposits in terms of Ge mineralization.