

## Cassiterite and wolframite Nb-Ta content in leucogranites, Central-Iberian Zone

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Sn–W quartz veins in the Central-Iberian Zone are associated to Variscan granites [1]. The Jálama batholith has three units: inhomogeneous granitoids, porphyritic granites and leucogranites [2, 3]. Ore minerals are mainly cassiterite and wolframite. Electron microprobe analyses from both ore minerals show that cassiterite has a higher Nb and Ta content than wolframite, and that the observed range in Nb and Ta concentrations is higher in cassiterite than in wolframite.

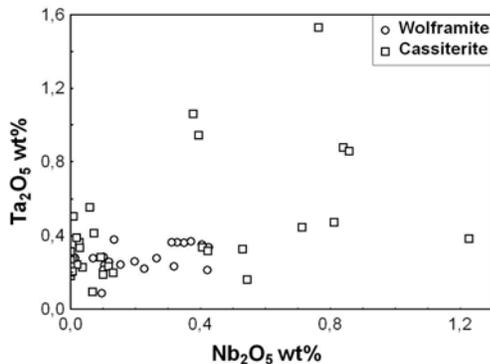


Figure 1: Nb<sub>2</sub>O<sub>5</sub> vs Ta<sub>2</sub>O<sub>5</sub> in wolframite and cassiterite.

Nb-Ta from granitic melt would deposit Nb-Ta rich cassiterite in a first magmatic mineralizing event. Therefore Nb-Ta are depleted and the magmatic evolution process would deposit Nb-Ta poor wolframite in a second magmatic-hydrothermal event.

[1] Neiva (2008) *Ore Geol. Rev.* **33**, 221–238. [2] Ruiz *et al.* (2008) *Chem. Erde* **68-4**, 337-450. [3] Fernández-Leyva *et al.* (2007) *SGA Vol.1*, 431-435.

## Growth and phase transformations in Mg hydrated sulfates: Effect of organic additives

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Crystal growth in the presence of organic molecules commonly occurs in nature and it is a strategy successfully employed in industry to control or avoid the growth of crystalline solids. Little is known about the effects of organic additives on the formation and transformations of highly soluble salts, such as Mg-sulfates. This may have important implications in agriculture, medical or chemical applications, where Mg-sulfates are commonly used, and also may be of interest in planetology, as deposits of sulfates (present in Mars and Jupiter satellites [1]) have been claimed as optimal places to look for evidence of extra-terrestrial life. [2].

MgSO<sub>4</sub>·7H<sub>2</sub>O (epsomite) crystals were precipitated in the absence and in the presence of additives (polycarboxylic and polyphosphonic acids) following free evaporation of saline solutions. Subsequently, they were subjected to TG, DSC, and FTIR analyses, and their dehydration was studied *in situ* by means of XRTD and hot stage-ESEM. Several of the tested additives act as inhibitors of epsomite crystallization and growth. AFM observations point to H-bonding between the organic molecules and epsomite water molecules on {110} as the main mechanism of additive-crystal interaction. The large number of water molecules on such faces reduces the selectivity of such interaction. Stepwise loss of water is observed both during the dehydration of pure and doped epsomite crystals. This reaction can be classified as a 3D, interface advancement reaction. The dehydration rate is substantially reduced in the presence of additives. These results are consistent with the establishment of H-bonds between the additives and structural water in epsomite and the lower hydrates resulting from the progress of the dehydration reaction. The combination of techniques used here is a novel approach which may give insights into the organic-inorganic interactions that are relevant in many fields, from planetary science to biomineralization or industrial crystallization.

[1] Chipera & Vaniman (2007) *Geochim. Cosmochim. Acta* **71**, 241–250. [2] Bishop *et al.* (2004) *International Journal of Astrobiology* **3**, 275–285.