Uranyl Groups coupled to Evansite Granite Vein Infills in the Porto Undergrounds (Nw Portugal).

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Introduction.- The Evansite mineralization associated to Porto granite vein infill's was firstly described by Rosas da Silva (1935) as layers up to 2 cm of amorphous $Al_2(PO_4)_{3\text{-}5}.nH_2O$ precipitated from recent hydrothermal fluids. This author analyzed the Porto Evansite screening a chemical composition of P_2O_5 % 12,20; Al_2O_3 % 40.62; H_2O % 40.03 which is roughly correct. In those years, Iglesias (1927) also found Evansite in several Spanish outcrops. Concurrently, it was described an amorphous hydrated phosphate from Campo Lameiro also in Galicia as pale greenish yellow fracture-fillings up to 1 cm thick in granite, so-called amorphous Bolivarite specimen with formula $Al_2(PO_4)_3.5H_2O$. Van-Wambeke (1971) studied a new uranium-Bolivarite from Kobokobo (Congo) and later, co-author Garcia-Guinea et al., (1995) demonstrated as the Bolivarite-type (Campo Lameiro, Spain) and the Evansite-type (Mt. Zeleznik, Slovakia) are the same mineral phase, and accordingly, the International Mineralogical Association (IMA) discarded the Bolivarite name. Sometime later, Van-Wambeke wrote us supporting the Bolivarite mineral denomination on the basis of that the Kobokobo Bolivarite has circa 0.3% uranium at the same time as we wait for further analytical opportunities to check the uranium content of all possible classic Evansite specimens from Porto, Zeleznik, Kobokobo, Galicia outcrops, etc. In July 2010 Evansite samples were taken in the underground galleries excavated in granite in Porto urban. The non-destructive current techniques (ESEM-CL) together with the strong CL-spectral visibility of the uranyl-water group placed in "white insulators" such as the hydrous $AlPO_4$ compounds offer an excellent system to analyze uranium to broad knowledge on the Evansite phase **(**Fig. 1**).**

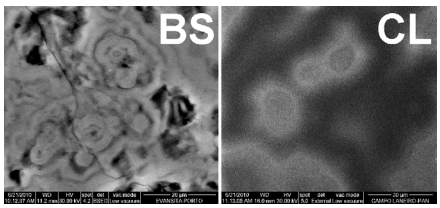
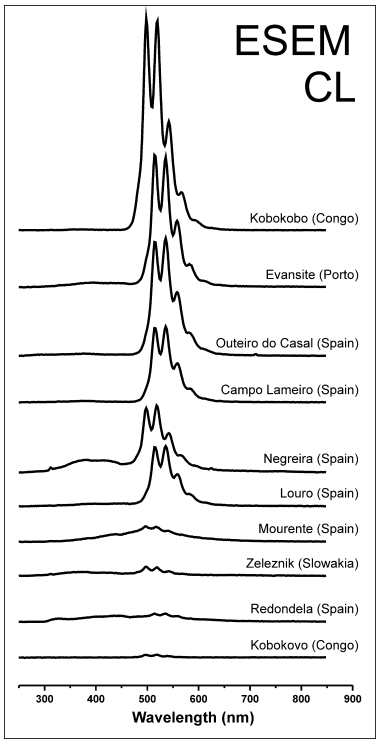


Fig.1: Porto Evansite: BS.- Backscattering ESEM image and CL.- Panchromatic CL image showing the physical positions of the uranyl groups.

A practical result of the analyses of uranium in the Porto evansites case me be useful to explain the high levels of radon gas (from 6000 to 7000 Bq/m^3) detected in summer 2010 in the Porto undergrounds coming from the Evansite infill veins throughout the well-know sequence U—Th—Rn. In addition, the radon gas ranges between 2 to 800 Bq/L in groundwater (Afonso et al., 2010).



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