

SEG 2024 Conference: Sustainable Mineral Exploration and Development

Nb-Ta Primary Oxides and U Secondary Minerals from Pegmatites in Central Portugal

Santos Barrios Sánchez¹, Juan G. Barreiro¹, Julio G. García¹, Vitor d. Maia², Wilck G. de Campos³, Ricardo Augusto S. Cipriano³

1. University of Salamanca, Salamanca, Spain, 2. Universidade Federal Minas Geraes, Belo Horizonte, MG, Brazil, 3. Universidade Federal Ouro Preto, Ouro Preto, MG, Brazil

The central Portugal stands out for the presence of important pegmatites with different fractionation and enriched in elements such as Nb-Ta-Be-P-Li. They are embedded in variscan granites (syn and mainly post kinematic) belonging to the Schist and Greywacke Complex of the Central Iberian Zone, which would have been produced by crustal melting with the change from compressional to extensional conditions (between 320 and 290 Ma).

In this work, we have analyzed Nb-Ta and U minerals from less known Be-P pegmatites, using a SEM-EDS (Department of Geology at UFOP). They occur in veins or groups of veins up to 1 m thick (e.g.: Chãs de Tavares, Rãs) or in pockets of tens of meters (e.g.: Real), with coarse to very coarse grain size, evident zoning and quartz core. In general, the Be-P pegmatites show a lower fractionation than the Li-enriched ones in the same area. The objective is to study their evolution degree and their application to the prospection of critical elements, comparing with previous data and those obtained by the analysis of new samples collected in well studied portuguese pegmatites (e.g: Senhora de Assunção).

BSE images show homogeneous Nb-Ta crystals. EDS chemical characterization shown mainly columbite-(Fe) and in minor proportion columbite-(Mn). In some crystals Ti and Sn partially substitutes for the Nb-Ta site. The Nb-Ta x Fe-Mn diagram allows us to observe a differentiation trend. Secondary U minerals are torbernite and autunite and occur in association with primary oxides.

Authors thank FAPEMIG-APQ 00764-23 and GREENest project.