Rare-element aplite-pegmatite vein field of Seixo Amarelo-Gonçalo (Guarda – Portugal)

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An area about 100 Km^2 of Central-Eastern Portugal wich comprises the Gouveia-Guarda - Belmonte -Sabugal regions has a large field of rare-element aplite-pegmatite veins. They are mainly sills generally < 3.5 m thickness wich penetrated mainly syn-D_3 (early, intermediate and late) hercynian granitic rocks.The mineralized sills generally occur in the contact of particulary differentiated two-mica granites, late-D_3. The richest aplite-pegmatite veins in Li and other rare elements outcrops in the Seixo Amarelo-Gonçalo region intruding mainly a porphyritic biotite granite (Guarda granite). We have distinguished "stanniferous" sills beije colour that occur at a lower level, are enriched in Si, K, Fe, and Sn and contain quartz, K-feldspar, albite, muscovite, Li-muscovite, montebrasite, topaz, apatite, beryl, cassiterite, columbite-tantalite, tourmaline, etc. The "lithian" sills occur at higher level, are pinkish colour, more evolved, enriched in Al, Mn, L. O. I., Li, Rb, Nb, Ta, and more complex with quartz, k-feldspar, albite, muscovite, lepidolite, petallite, montebrasite, topaz, apatite, beryl, cassiterite, columbite-tantalite, microlite, tourmaline, etc. The "mixed" sills are located between the stanniferous and lithian sills and have an intermediate composition. The microthermometric data suggests the decrease in temperature and salinity of fluids from minerals of stanniferous sills to those of lithian sills. The occurrence of petalite and rare spodumene suggests about 3.5-4 Kb and 610-650°C for the main magmatic crystallization of sills but lepidolite, albite and quartz crystallized at 1.3 Kb and 330-350°C showing the importance of post-magmatic and hydrothermal processes.