

Lithochemistry of the granites of Penalva do Castelo pegmatite field (Central Portugal)

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The monzogranites from Penalva do Castelo, associated with REE-LCT pegmatites with prominent beryl, are controlled by a variscan alignment with the main NW – SW direction. This alignment is deformed by the transcurrent system known as the Penalva do Castelo - Juzbado Shear Zone with semi-ductile left movement and direction N70°E, and by post-Variscan dextral displacements of lesser expression NNE – SSW. Guided by the late parallel system, the brittle shear system is also responsible for the emplacement of aplite, pegmatite, quartz, and basic and intermediate rocks. The monzogranites result from distinct magmatic pulses with reverse magmatic impression in the last members of two groups, a possible cause of the prevalence and specialization of the pegmatites. This statement is supported by the saturation of silica, aluminosity, REE, and Al_2O_3/TiO_2 , Rb/Sr, Zr/Hf, FeO_t, TiO₂, MgO, Zr, and Y. However, the two groups are different: the FeO_t / (FeO_t + MgO) decreases in the trend of the last coarser-grained group, and there is an intragroup variation for Sr/Nd, Rb/Ba, Li^{10^3}/Mg , $Ba^{10^3}/(K + Na)$. The last member of each group has a more pronounced crustal contribution and more oxidizing conditions as a possible thermodynamic change during melt extraction in the anatexis of metasediments. The general trend throughout the set is of alkaline-calcic and ferrous composition, except for the oldest monzogranite, and there is an enrichment of the mineralization of Sn, Be and U.