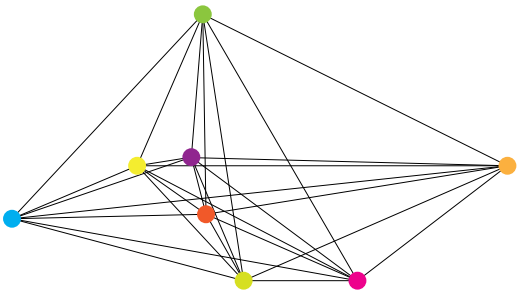

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Contributos da Geoquímica para um Futuro Sustentável

Livro de Resumos · *Abstract Book*

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The possible role of assimilation processes in the genesis of the marginal diorite sequence of the Beja Layered Gabbroic Sequence

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Abstract

The Beja Igneous Complex (BIC) is a major geological entity of the SW Iberian Variscides, extending for over 100 km along the southern border of the Ossa-Morena Zone (OMZ). The BIC intruded the OMZ metasedimentary-metavolcanic autochthonous sequences during the main collisional stages of the Variscan orogeny (ca. 355–345 Ma). The Beja Layered Gabbroic Sequence (LGS) corresponds to the most primitive and presumably older unit of the BIC, hosting various occurrences of Fe-Ti-V oxide and Ni-Cu sulphide mineralization types. The LGS is bordered by several marginal diorite bodies whose genetic relationship to this unit is not well understood. The diorite rocks cropping-out at Torrão lie at ~10 km to the North of the most primitive rocks identified in LGS. Previous studies reveal that the diorites are roughly concurrent with the LGS and show enrichments in Fe and Ti (average TiO_2 = 1.7 wt%) comparable to the LGS oxide-rich gabbros. Preliminary results from ongoing detailed field and geochemical studies of the Torrão diorites are here reported. Three main rock types were identified in the Torrão area: diorites, quartz-diorites and pegmatoids. Diorites and quartz-diorites are composed of plagioclase, green-amphibole, and oxides (magnetite + ilmenite) that can reach considerable modal abundances. Pegmatoids occur within the other two rock types and comprise coarse-grained brown-amphibole and plagioclase. Amphibole TiO_2 contents decrease from 2.36 wt% in the diorites to 2.02 wt% in the pegmatoids and 1.39 wt% in the quartz-diorites, indicating decreasing formation temperatures for each suite. High anorthite molecular contents of plagioclase are related to the diorites, andesine- to oligoclase-type plagioclase is related to the quartz-diorites and albite is only present in the pegmatoids. One striking feature hitherto unreported is the abundance of amphibolitic enclaves within the diorite rocks. These enclaves are composed of grano-nematoblastic amphibole and plagioclase, sharing many features with equivalent rocks included in the Neoproterozoic sequences that form the OMZ basement. The P-T estimates obtained from mineral chemistry point towards an isobaric cooling episode for the diorites and quartz-diorites, from ~830 to 730º C at 4.5 kbar, identical to the emplacement pressure estimated for LGS; temperature estimates for the amphibolites are alike to those gathered for diorite rocks. Obtained data thus far are broadly consistent with the current proposed model for the genesis of the Torrão diorites. However, the widespread occurrence of amphibolite enclaves raises the question of whether other rocks forming the OMZ autochthonous could have been involved in this magmatic event, contaminating the LGS melts. Apart from its petrological significance, this question is relevant because many mineral occurrences in this region, some developing evident magnetic anomalies, are scattered across the contacts between igneous rocks and the autochthonous OMZ sequences. The Fe and Ti enriched signature of the Torrão diorites might be related to mineralizing processes like those documented for LGS, however, the possible compositional influence of other pre-existing rocks and their interaction with the gabbroic/dioritic melts can potentially be of economic importance.

Keywords: Diorite; Amphibolite; Oxides; Gabbro; Assimilation

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