

PETROGRAPHY OF THE PIRIZ GRANODIORITE, PUNTA DEL ESTE TERRANE, SE OF THE URUGUAYAN SHIELD

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ABSTRACT: The Piriz Granodiorite is located in the Punta del Este Terrane, SE portion of the Uruguayan Shield, crosscutting metamorphic rocks of Cerro Olivo Complex. This granodiorite is characterized by a N70°E magmatic foliation, usually marked by K-feldspar phenocrysts and/or by biotite, and presents xenoliths of charnockitic orthogneisses, pelitic and calc-silicate paragneisses and metamafic-metaultramafic rocks, ranging from amphibolite to granulite facies. The xenoliths, which are centimetric, have tabular/rounded shapes and strongly oblate/prolate fabrics. The granodiorite is pale-grey and equigranular, with hypidiomorphic texture. The main mineralogy is composed of plagioclase and minor K-feldspar phenocrysts, quartz, biotite, muscovite, cordierite, garnet and accessory minerals (zircon, apatite, opaque minerals, monazite, titanite and occasionally tourmaline). K-feldspar shows core to rim compositional zonation and cross-hatched twinning and lamellae of perthite are common. Microcline crystals are subhedral to euhedral and coarse to medium-grained. It is partially poikilitic with a few inclusions of quartz, biotite, cordierite and white mica. Plagioclase is fine- to coarse-grained and, though considerably less abundant than microcline or quartz, it is a major phase. Fine-grained plagioclase is anhedral, generally showing polysynthetic twinning and normal zoning. The coarse-grained variety forms euhedral tabular crystals, with polysynthetic twinning and normal zoning. Quartz is medium-grained and anhedral, showing undulose extinction and, locally, subgrains. The biotite is tabular, mainly subhedral and shows brown pleochroism. Coarse-grained biotite is homogeneously distributed in the rock, whereas fine-grained crystals are present as inclusions in cordierite or K-feldspars. Muscovite occurs as subhedral (primary) and anhedral (secondary) crystals. Cordierite is coarse-grained, euhedral to subhedral, showing typical pinite alteration. It is generally poikilitic, with inclusions of opaque minerals, white mica, biotite, and zircon (which is surrounded by pleochroic halos). Some samples of the Piriz Granodiorite contain garnet and sillimanite (coarse-grained garnet shows reaction textures and sillimanite acicular inclusions), especially samples of leucosomes originated by partial melting of the high-grade metamorphic rocks. It strongly suggests that these minerals are refractory residues (restites) or xenocrysts. The petrographic characterization of the Piriz Granodiorite demonstrates the intimate relation of its genesis with the rocks of the Cerro Olivo Complex, which represents an important episode of crustal melting in the Punta del Este Terrane after the peak of the high-grade regional metamorphism (~660Ma).

KEYWORDS: PETROGRAPHY, PIRIZ GRANODIORITE, CORDIERITE, PUNTA DEL ESTE TERRANE