


Clay mineral assemblages as the key to understanding alteration processes in basalts from the province of Corrientes, Argentina

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Resumen

In the Mesopotamia region (Argentina) basalts are exploited as aggregates for different applications. Depending on the alteration they have undergone, their properties can be affected, especially if the rocks are altered to swelling clay minerals. The objective of this work is to contribute to understanding the local alteration process of basalts from the province of Corrientes and propose an alteration sequence. Mineralogical-chemical and textural studies were performed on the rocks by stereomicroscopy, polarizing microscopy, μ -XANES, SEM-EDS, and EPMA. In addition, X-ray diffraction, FTIR, DSC-TGA, cation exchange capacity, and exchangeable cations were determined on the material extracted from the cavities. According to the results obtained, secondary products would have formed by the interaction of the rock and hydrothermal fluids at temperatures likely $< \sim 100$ °C– 150 °C. Different alteration stages were determined (Stage 1 to

5), recognizing swelling clay minerals (saponite, Al-saponite, Fe-beidellite, beidellite-montmorillonite) +/- Fe-oxyhydroxides, calcite and, microcrystalline and cryptocrystalline silica as the main alteration phases. Pyroxene and plagioclase would have acted as the main source for the formation of clay minerals, while intercrystalline K-feldspar remains unaltered.

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