

GEOCHEMISTRY AND MINERALOGY OF PLIOCENE CLAY DEPOSITS FROM WEST PORTUGAL: PROVENANCE SIGNALS?

Álvaro Oliveira¹, Pedro A. Dinis^{2,}
and Fernando T. Rocha³*

¹Laboratório do INETI de S. Mamede Infesta, Porto, Portugal

²Department of Earth Sciences, IMAR-CMA,
University of Coimbra, Portugal

³Geobiotec Centre, Department of Geosciences,
University of Aveiro, Portugal

ABSTRACT

In this work is presented a comparative study of mineralogical and geochemical (major elements) data of Pliocene clay deposits from west Portugal. Quartz occurs in larger amounts in the coarser sediments and is usually the most common mineral in the deposits north of Mondego river. Illite proportion is always higher in the basins to the north of Mondego, while kaolinite tends to be higher in the southern basins, where it is often the most common mineral. One set of samples from lower stratigraphic position of the northern sector (Vale Grande) has mineralogical features that resemble the southern deposits. In accordance with the mineralogical

* Corresponding author. E-mail: pdinis@dct.uc.pt.

composition, silica and alumina are the most common oxides. Silica tends to be higher in coarser samples, in particular in the deposits south of Mondego river. Potassium oxide content is always higher in the northern than in the southern deposits. The observed differentiation between clay deposits is attributed to provenance. The deposits located to the north of Mondego river were derived mainly from the Precambrian metapelites of the Central Iberian Zone. Regarding the deposits to the south of Mondego river, the dominance of kaolinite and high Al_2O_3 content suggest that they result mainly from recycling of Cretaceous and Cenozoic units, which, in turn, derive from weathering and erosion of granitoids and metasedimentary rocks. Some older deposits north of Mondego were also originally sourced by previous cycle sediments, but provenance must have shifted to basin-edge metapelitic rocks due to uplifting of coastal mountains, which blocked the drainage from the hinterland. Besides provenance, hydraulic selection could explain local compositional differences.