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# ORGANIC PETROLOGY OF BLACK SHALES ASSOCIATED WITH Cu MINERALIZATIONS IN OSSA MORENA ZONE, SOUTH PORTUGAL; THE REGIONAL BACKGROUND

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Black shales (BS) are dark colored mudrocks with variable amounts of organic matter (OM), which accumulate together with silt- to clay-size particles in environments with reducing conditions. The OM present in rocks may have an active role in mineral diagenesis and in mobilization, transport, concentration, reduction, preservation and deposition of metals. The main goal of this work is to characterize the OM present in BS from three different areas that are spatially associated with Cu mineralization in the Ossa Morena Zone (Iberian Variscides), in order to characterize the regional background related with maturation of organic particles during the Variscan orogeny. The BS samples were collected in Alandroal (near the Mociços and Ferrarias occurrences) and Barrancos (near the Minancos ancient mine) districts, which belong to the Sousel-Barrancos metallogenic belt. These three occurrences correspond to Cu mineralized veins, which result from hydrothermal fluids circulation during late Variscan times. The mineralized veins contain quartz, carbonates and sulfides, and cross-cut Paleozoic metasedimentary sequences, namely the Ordovician-Devonian succession. In these occurrences, supergenic enrichments are common.

A total of ten samples of BS were collected in outcrops of Silurian BS from "Xistos com Nódulos" Formation in both districts, all of them near the previous mentioned occurrences, although not or slightly affected by the main mineralized structure. The petrographic analyses to identify and characterize the OM were performed on whole-rock polished blocks prepared under standard procedures. The random reflectance, an indicator of thermal maturation that can be useful to establish the paragenetic sequences of ore deposits, was also measured according to standard procedures.

The petrographic observations allowed the identification of vitrinite-like OM particles in all samples. The organic particles are generally thin and elongated, occurring, essentially, interbedded along mineral matter. The inorganic matter is mainly composed by clays and silicate minerals. The presence of iron oxides and carbonates was also identified occurring in association with OM. The mean random reflectance of vitrinite-like particles from Alandroal varies between 2.93% and 3.86% and between 3.34% and 3.38%, respectively near the Mociços and Ferrarias occurrences, and between 2.05% and 5.05% in Barrancos. The petrographic observations revealed some organic particles exhibiting single flakes graphitic features. In addition, some organic particles observed mainly in Barrancos, appear to be remains of zooclasts, such as graptolites. The occurrence of graptolites in the Silurian "Xistos com Nódulos" Formation is described in the literature. These reflectance values should be representative of the regional background related with the regional metamorphic events. However, previous studies about other Cu mineralization in Sousel-Barrancos metallogenic zone indicated that higher reflectance values are obtained closer to the mineralized veins, as a result of thermal processes associated with the genesis of the mineralization and circulation of hydrothermal fluids.

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