MATURATION OF PORTUGUESE GEOMATERIALS FOR PELOTHERAPY APPLICATION

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Maturation process is a complex and multifactorial process that allows the improvement of the quality of the material and endows the mud with organic substances produced by microorganisms developed during the process. Time of maturation, light exposure, stirring procedures, temperature and raw material properties, for instance, have influence on the characteristics of the final mud, the peloid. We designed a maturation survey in order to study the effects of maturation on the properties of some Portuguese geomaterials. Two natural mud samples from São Miguel (Azores) and one natural Portuguese bentonite were submitted to maturation during 120 days. Azorean samples and bentonite were sieved at <63 μm and <90 μm, respectively, and kept covered by a layer of mineral water during the entire process at 20 ºC. The abiotic conditions were restricted to natural and artificial light and bimonthly stirring procedures. Mineralogical, chemical and physical analyses were performed before and after the maturation period to raw materials and final mud. Virgin muds are finely grained (above 80% of <63 μm fraction), and reveal a composition consisting mainly of alunite, feldspars, quartz and amorphous aluminosilicates; kaolinite is the main clay mineral. Bentonite shows over 71% of <63 μm fraction and mineralogical composition consisting mainly of smectite, feldspars and calcite. Chemical composition analysis of samples reveals high content on SiO_2, Al_2O_3, Fe_2O_3, K_2O, Na_2O and TiO_2. Bentonite sample presents higher percentage of Fe, Ca and Mg than Azorean muds, instead volcanic materials are richer on S and K. Slightly enrichment on Na and Ca was detected on samples after maturation. According to the results some properties such as cation exchange capacity, exchangeable cations and cooling kinetics were improved by maturation. The bicarbonated-sodium type of mineral water used for maturation seems to influence some of these properties.

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