COPAHUE, ARGENTINA: MUD MATURATION FOR ITS POSSIBLE APPLICATION IN HUMAN HEALTH

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Copahue volcano is situated in the province of Neuquén, Argentina. Several geothermal features like hot springs, ponds and fumaroles, occur in the surroundings of Villa Copahue. The associated geothermal system causes the occurrence of singular thermal muds with important presence of sulphur and clay minerals. In this place an international-level thermal complex, Copahue Thermal Center (CTC), was developed for therapeutic treatments under medical supervision. These peloids are extensively used for the treatment of several rheumatic, muscle, neurological and dermatological pathologies. The natural mud have a composition rich in sulfur, as well as clay minerals kaolinite and smectite type, which are in contact with a highly acidic liquid phase with high salt content and dissolved gases (Baschini, et al 2010). These muds, a nonrenewable resource, are used and discarded causing a strong impact on the system. The objective of this study was carried out an experimental maturation of muds in the CTC, from regional clay minerals and acid water of the place, in order to obtain similar materials, in composition and properties, to the natural ones. An Experimental Station (ES) was built with a wooden container with about 4000 L of capacity, where kaolinite and smectite (in proportions 75:25) from regional deposits were mixed with natural thermal acidic waters. The pH value of the system was about 3 and the temperature was about 55C during all the experience. At different times for a period of 1 year samples from the ES were taken and analyzed. The properties evaluated were cationic exchange capacity, specific surface, Atterberg limits, kinetic cooling and color. The best properties of the muds in relation to these parameters were achieved at the third and fourth months from the beginning of the process. SEM, XRD and Infrared techniques were used to evaluate the maturation evolution. The results showed a good cementation of the material and the gradual incorporation of sulfur into the system. The results showed that the maturation process of muds can be produced, in a period of four months, a material with very good properties for therapeutic use.

[1] Baschini M.T., Pettinari G.R., Vallés J.M., Aguzzi C., Cerezo P., López-Galindo A., Setti M., Viseras C., Suitability of natural sulphur-rich muds from Copahue (Argentina) for use as semisolid health care products, Applied Clay Science 49, 205–212, 2010

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