Physical study of Hévíz peat

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Introduction. The healing properties of Lake Hévíz waters have been known since immemorial time even at the end of the Stone Age. The city and the bath began to develop in the 18th century. Lake Hévíz, is the second largest thermal lake in the world, but biologically the largest active natural lake. Its temperature is affected by the combination of hot and cold thermal waters. The water flows in a cave with a flow of approximately 410 liters per second, with a temperature of 40°C. The biological stability of the lake is shown by the temperature of the water, which has not changed even in the coldest days of winter it does not fall below 24°C, that makes it possible to bathe in the lake all year round. In summer, water temperature can reach 37°C.

Material. The sample was facilitated by the peloide production plant of Lake Hévíz and the item was labeled with manufacturing date of 2017/05/03 and except for its transport to Spain, in winter, it was kept in a refrigerator until the physical determinations were made.

Methods. The ratio of solids and ash were determined by gravimetry, after desiccation in an drying oven at 105ºC and incineration in a muffle oven at 800ºC. The values of the thermal properties, specific heat and retentivity were obtained by calculation from the previous data. The instrumental texture was determined with the Texture Analyzer model 1000 of Brookfield brand LFRA. To obtain the cooling curves, Rambaud technique was used, using Lauda thermostatic baths, Lauda models RA Alpha 8 and E-100, and a Cole-Parmer thermostatic probe, model 91100-50. The graphs of the experimental curve and the equations that best fit, were obtained using the ORIGIN 8.6 program.

Discussion-Results. The results of the analyzed parameters have been gathered in the attached Table 1. From these we see that it is a dark colored product, with a fairly homogeneous appearance, with a high percentage of water of 77.7%. Its ash content 10% is large enough to indicate the presence of inorganic compounds in its composition, corroborated by the Ash/Solids ratio that indicates a close ratio of 1:1 between inorganic and organic materials. The particle size, shows an irregular dispersion and in detail, up two families of products. One with an average size of about 10 μm and a second with a size of 70 μm. Figure 1. Regarding the instrumen-

tal texture, it has a low cohesion value, 0.3 and a hardness of 139 g characteristic of homogeneous materials, but with a very high adhesive value of 1,272 gs suitable for use in topical applications. The TPA chart, Figure 2, is not characteristic of a peat, Figure 3, for not presenting adhesiveness area, although it shows a peaked zone of its own load, and is similar to clays due to its defined adhesion zones.3 (Figure 4). The heat capacity is high, in the order of 3.8 kJ / kgK, according to its high water content. The relaxation time of more than 10 minutes is also very high, this implies a very slow release of heat.

Conclusions Taking into account the mechanical and thermal characteristics of this peat, the applications and the baths prepared with them will be pleasant and are an adequate product as a thermotherapy treatment.