

ABSTRACT

The Sidarjo mud (LUSI) is a natural phenomenon which is still ongoing. One of the composition of the mud from LUSI is mineral clay. Mineral clays have physical and chemical properties that are often used in various industrial fields. This research is based on the influence of the composition of LUSI on the ordering process of nanoclays and the utilization of nanoclays. The sludge samples were analyzed using petrographic analysis, X-Ray Diffraction (XRD), ICP AES and ICP MS. The analysis showed that the mineralogy of LUSI consisted of smectite, kaolinite, quartz, clinopyroxene, plagioclase, calcite, pyrite, and dolomite. Based on the results of mineralogical analysis, it becomes the basis for conducting nanoclay ordering experiments using the sonometric method. To determine the optimum conditions, this study was designed using the response surface approach (RSM) methodology. The research method used is processing clay minerals into nanoclays using the sonometric method so that 27 nanoclay samples were reanalyzed using XRD and further assessed RSM to distinguish the interaction between parameters and optimal conditions. Nanoclay XRD analysis results show that the fact that the nanoclay contains montmorillonite, smectite, and kaolinite minerals. From the RSM assessment, the optimal order of nanoclay was obtained at an average particle size of 39 nm to 41 nm of nanoclay with a concentration of 1.8 M NaCl solution and a sonication time of 4 hours to obtain a % yield of 20.448. Thus, from the results of nanoclay characteristics, clays from LUSI can be applied as a material for making cosmetics.

Keywords: Clay minerals, nanoclay, sonometric method, response surface methodology.