Thesis Title Thai Kaolin : Appropriate Technological Development for Pharmaceutical Purposes

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ABSTRACT

The objectives of this study were to develop Thai kaolin of a common grade to be higher in quality for using in pharmaceuticals applications, and to compare the quality of a developed kaolin with a Light Kaolin BP from England.

The appropriate selected samples were taken to develop its texture and purity in the laboratory by an appropriate technology. The samples were from Hudsompan mine, Ranong and from Pongthevee mine,Chieng Rai. Technology used for improve the texture was the wet-sieving through a 400-mesh sieve, and technology used for impurities removal were 1. aqueous leaching, 2. acid leaching (with 1N HCl), 3. bleaching with sodium dithionite ($Na_2S_2O_4$), 4. chelation with EDTA, 5. acid leaching (with 1N HCl) & bleaching with sodium dithionite ($Na_2S_2O_4$), and 6. acid leaching (with 1N HCl) & Chelation with EDTA. Conditions of the experiment were varied to compare the gained results; they were the quantity of reagent, temperature of treating, and duration of action. Treated samples were apropriately selected to test with the specification of Light Kaolin(Natural)BP 1988.

From the experimentation, it was found that samples from Hudsompan could be more purified by the acid leaching (some condition),the acid leaching& bleaching with $Na_2S_2O_4$, and the acid leaching & chelation with EDTA. The samples from these three technologies (H_{WH0},H_{WHN1},H_{WHE1}) showed the decreasing of ferric oxide and the increasing of the brightness (ferric oxide: 0.71, 0.68, and 0.67%, respectively,and the untreated sample (H_w) showed 1.41 %, brightness: 91.77, 91.12, and 92.92 %, respectively, and the untreated sample (H_w) showed 85.98%) The standard kaolin from England (E) contained ferric oxide 0.68% and had 91.34% of brightness. When testing these three treated samples with the BP specification, it was found that they mostly complied with the specification except for the quantity of coarse particles and the soluble matter. If using more efficient instrument of classification or improving particle size by grinding with a suitable grinder, Thai kaolin from Hudsompan deposit can be produced as a pharmaceutical grade and its quality is equal to the English one. For the Pongthevee sample, although its brightness increased after acid leaching to be 83.14 % (from 78.9 %) the developed clay was not white in color. So it was got rid of the BP-specification testing.

This laboratory-develoed kaolin should be further studied for the more suitable method or condition to reduce the expenditure of production before using. The study about suitable instruments for production shoud be done in the large-scale operation or in pharmaceutical industry. The simple and economic method can be used for self-medication in rural area and for the primary health care as well.