A New Clay Mixture for Production of Ceramic–like Wares at Low Temperature

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The objective of this project was to reduce the cost of ceramic wares production by developing new clay mixture. We found that Lac could be used as efficient binder. First, we prepared different Lac and kaolin (white clay) samples, containing different Lac and clay ratio, using the Lac solution we prepared in methanol and unsolubilized Lac. Next, the clay samples were set in similar molds to form 12 cm.rod shape with 1cm. diameter. The materials were baked at 200 degree Celsius. The quality of our materials were compared to normal ceramic with similar shape and size in terms of hardness, absorption, weight, which are the reference of Industrial Standards Institute of TIS. 602-2529. The energy consumption in the production was also compared. The sample with Kaolin:Lac ratio at 1000:300 w/w using our Lac solution showed the least shrinkage rate. The sample with Kaolin: unsolubilized Lac ratio at 1000:300 w/w was strongest, with the least absorption rate. The desired qualities of ceramic wares are low percentage of shrinkage, greater hardness, and low percentage of absorption. From our experiments, clay mixture made from the w/w ratios of kaolin: unsolubilized Lac w/w at 1000:100, 1000:200, and 1000:300 were all suitable for use in producing ceramic-like material with compatible quality to normal ceramic. Most importantly, our products were baked at low temperature of 200 degree Celsius for 30 minutes while normal ceramic wares were baked at higher than 1000 degree Celsius for72 hours, resulting in much energy and time saving.

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