Synopsis of Original Research Paper

Development of evaluation technique of particles dispersion and aggregation state in liquid for cosmetic powders

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It is important to characterize and control the particles dispersion state in slurries in order to obtain the products with desirable properties. Thus, the particles dispersion state in various aqueous slurries were investigated by using the hydrostatic pressure measurement and the osmotic pressure measurement. The particles dispersion state in slurries were changed by adding a dispersant or controlling the slurry pH value. For the hydrostatic pressure measurement, the particle dispersion state of not only spherical particles but also irregular shaped particles such as platy ZrO_2, could be successfully evaluated. It was shown that the packing fraction of green body had a good connection not to the apparent viscosity and the median diameter of particle size distribution, but to the settling time determined by hydrostatic pressure measurement. For the osmotic pressure measurement, it was demonstrated that the amount of coarse particle that simulated the aggregates in the nano particle slurry could be estimated from the osmotic pressure change. It was also found that the nano composite with relatively homogeneous microstructure could be obtained from the well-dispersed nano particles slurry which displayed relatively large osmotic pressure.