

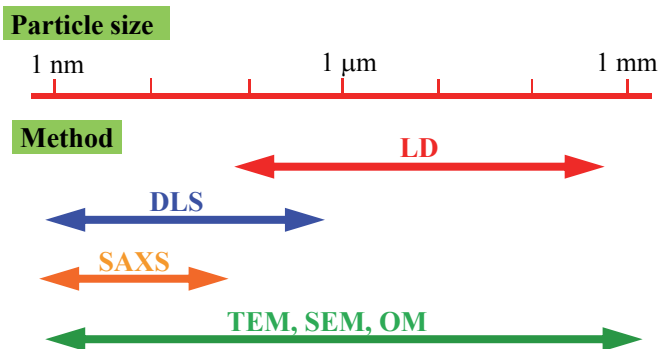
Analytical techniques for particle size distribution and wettability of the powder

In the particle size distribution measurement of the powder, it is necessary to select an optimal measurement method matching to the range of the particle size and particle size distribution. Dispersibility of the powder depends on the interaction energy between the solvent and the particles (wettability, etc.). Wettability can be estimated from the heat of immersion obtained by micro-calorimeter.

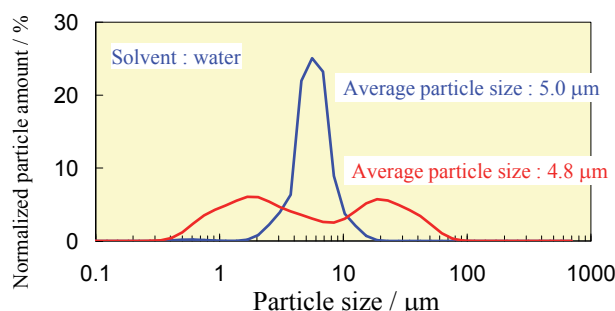
Analytical techniques for particle size, wettability, etc.

Analysis subject	Method	Obtainable characteristics
Particle size	Laser diffraction (LD) Dynamic light scattering (DLS) Small-angle X-ray scattering (SAXS) Microscopy (TEM, SEM, OM)	Particle size and Distribution
Zeta potential	Electrophoretic light scattering	Electrostatic repulsive force
Heat of immersion	micro-Calorimeter	Wettability
Contact angle	Sessile drop method	

Range of detection of the particle size measurement

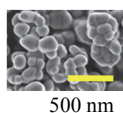
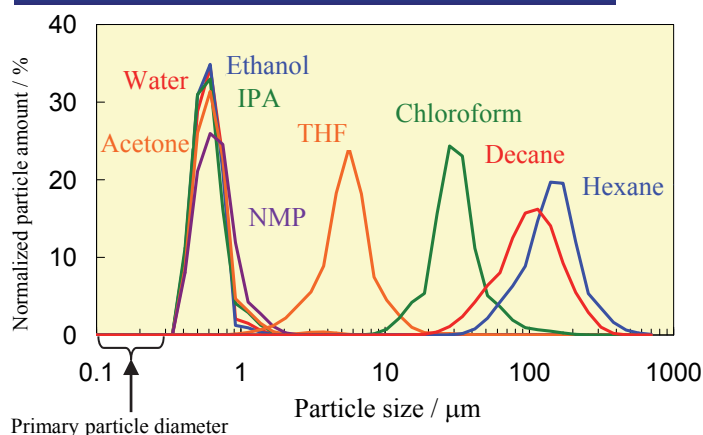


Average particle size and particle size distribution



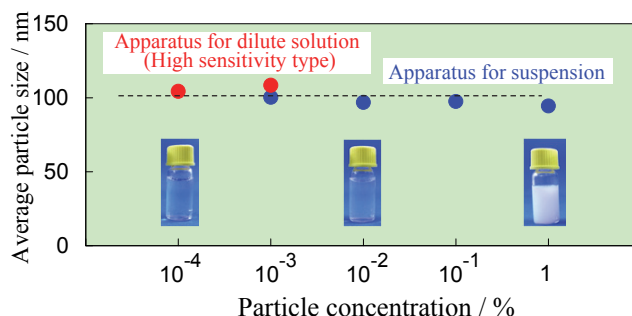
The particle size distribution of two types of alumina measured using laser diffraction. In this case, although the average particle size shows the same value, the particle size distribution shows the different pattern. Therefore, it is important to determine not only the average particle size, but also the particle size distribution.

Relationship between particle size and wettability

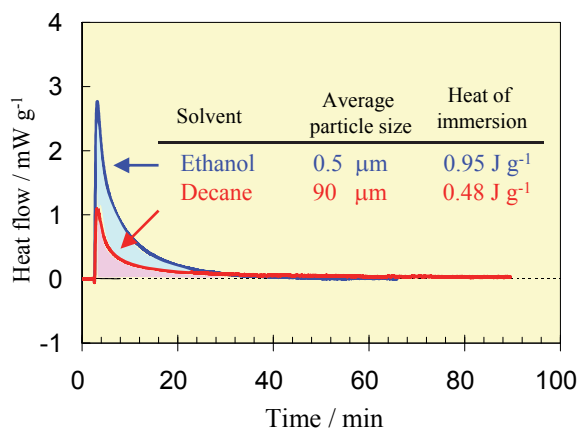


The particle size distribution of titanium oxide in various solvent measured using laser diffraction. Depending on the effect of electrostatic repulsion and/or wettability between the solvent and the particle, the size distribution of the particle (condensed state) shows the different pattern in each solvent.

Average particle size and concentration of particle



The average particle size of polystyrene powder measured using two types of dynamic light scattering (DLS) apparatus. DLS can be measured the particle size of the wide concentration range solution (dilute solution ~suspension).



The particle size in the solvent becomes small, as the heat of immersion becomes larger (wettability becomes good). Interaction energy between the solvent and the particle surface can be estimated from the heat of immersion.