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### **Nano particle size distribution measurement in the fluid**

Many kinds of intelligent fluids such as magnetic fluid, electro rheological fluid, emulsion and micro bubble fluid are prepared. The direct measurement of those fine particles size distribution of dispersions in liquid is important for the preparation and stability estimation of those intelligent fluids. The in-situ nano to micro particle size in colloids are usually measured by light scattering method; however, it is difficult to measure at high concentration of suspension. Here, a novel dynamical method by using the interactive force measurement (IMF) between particles in liquid under electric field or magnetic field is used for measuring distribution of fine particles. The solid particle size distributions are compared with the size distributions of dried particles measured by TEM or SEM. Some size distribution results measured by IMF agree well with those by TEM or SEM. The well-dispersed nano to micro particle size distribution by IMF is influenced by the nano size surfactant micelles. The size distribution of coagulated nano particles in liquid is larger than the result by TEM or SEM. Also the liquid particle or air bubble size distribution can be measured by IMF and the results are discussed.

### **Biography**

Toyohisa Fujita is a Director of Research into Artifacts, Center for Engineering, also Professor of Department of Systems Innovation, Graduate School of Engineering, The University of Tokyo, Japan. He was a Professor of Akita University from 1995 to 2003. During his stay in Akita, he was a chairman of satellite venture business laboratory from 2000 to 2002. He was a visiting fellow in The University of Minnesota, visiting Professor of St. Cloud State University in USA and Tohoku University and Akita University in Japan. He was a President of The Resources Processing Society of Japan from 2005 to 2009. □Fujita's research interests are recycling technology, mineral processing, environmental purification and preparation of intelligent fluids with nanotechnology. He has about 30 awards from the different kinds of societies. Also he has over 400 publications and submitted over 60 patents.

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