

**A low-pressure differential mobility analyzer (particle size classifier)
and its application to nanotechnology**

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Particle size is an important parameter for characterizing the behavior of nanoparticles. Most properties of nanoparticles depend on particle size, some strongly. Nanoparticles formed in either chemical or physical reactors are of interest in the field of material science because such particles have characteristics significantly different from those of bulk materials. Nanoparticles formed in semiconductor processing are contaminants that decrease the semiconductor device yield. For these reasons, the technology becomes significant that measures the size distribution of nanoparticles and classifies the particle size to yield monodisperse nanoparticles (of a size). In this talk, the details will be given on the operation principle of a differential mobility analyzer (DMA)-a particle size classifier, development of the DMA that operates at low pressures, and application of the low-pressure DMA to both nanoparticle measurement in a plasma-enhanced chemical vapor deposition reactor and production of monodisperse ferroelectric nanoparticles ($\text{Pb}(\text{Zr}, \text{Ti})\text{O}_3$).