機械工学セミナー
Mechanical Engineering Seminar

第3回　No. 3

主催：慶應義塾大学理工学部機械工学科
Department of Mechanical Engineering, Keio University

日 時(Date)：
2016年10月7日(金) (October 7, 2016 (Fri.))　17:00～18:30

場 所(Venue)：
セミナールーム 1 (Seminar Room 1)（14-201）

講演題目(Title)：

From nucleation and growth of nanoparticles (including deliquescence and efflorescence behavior, droplets and bubbles) - to micelle formation and relaxation

講 演 者(Speaker)：

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Abstract:　The mechanisms of formation (through nucleation or aggregation) and the regularities of growth of nanoparticles of different origin and under different conditions have, in principle, many similarities. From the point of statistical physics, it can be explained by the generality of corresponding kinetic and thermodynamic equations which are applied for description of non-equilibrium and equilibrium states of many-body systems. A special role here belongs to systems with diffusion material and heat transport. And these similarities will be in the focus of this lecture. Of course, there are also many specific features in behavior of solid, liquid or gas particles concerned with character of the intermolecular forces and chemical composition of molecules, and I will try to fix an attention on these peculiarities as well.　The following problems related to different nanoparticles, from droplets and clusters to crystals, bubbles and spherical and cylindrical micelles will be in the scope of my lecture
- The effect of the sign of ion charge in the ion-induced nucleation
- Nucleation on wettable particles at very low vapor supersaturation
- The effects of surface activity at nucleation on soluble particles
- Condensation with the dissolution of condensation nuclei and reverse crystallization of nuclei in the solution
- Transient nucleation on wettable condensation nuclei
- Thermodynamics of deformable drops in non-central electric fields
- Calculation of the properties of small droplets in the framework of the density functional theory
- Transient dynamics of diffusive growth of multicomponent droplets and bubbles
- Micelles as stable supramolecular structures
- Polymorphic transformations of micelles
- The kinetics of aggregation, decomposition and relaxation in micellar solutions.

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