

Fundamentals of Crystal Growth of Nano-Submicron Particles Associate Professor Yoshihisa Suzuki



Content:

- A. <u>Colloidal crystallization</u>: Colloidal crystals are hoping materials for optical circuits and optical computer in the future. We have successfully fabricated bulky grains (~ 6.1 mm³) of a close-packed polystyrene colloidal crystal ((a)) by centrifugation. Recently, we have also studied dynamical crystallization processes at a single particle level using colloidal crystals with depletion attractions (b).
- B. In situ observation of molecular steps on protein crystal surfaces and novel crystallization techniques without any precipitants: Fundamental studies and developments of novel techniques of protein crystallization are important for obtaining high quality crystals, which are prerequisites of genomic drug discovery. We are now studying kinetic bahaviors of molecular steps on the surface of a glucose isomerase crystal ((a)). We have also succeeded in fabricating high quality lysozyme crystals without using any precipitants ((b)) for the first time.
- C. Precise growth mechanisms of protein crystals under <u>microgravity</u>: Microgravity is known to be a good environment for obtaining high quality protein crystals. Our Advanced Nano Step (AdNano) mission ((a)) in the international space station (ISS) is currently underway. Now, we analyze growth rates of glucose isomerase crystals during the fifth flight of AdNano mission in ISS. We have also used parabolic flight opportunities ((b)).

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