Details of Technology

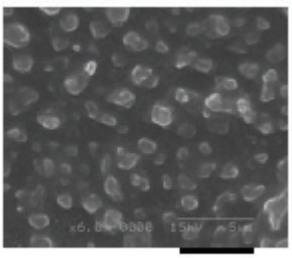
Name of Technology	Particle-size control technology for monodisperse crystal	Chemistry
Name/Post/Faculty	Norihito Doki / Associate professor / Applied Chemistry Department, Faculty of Engineering	
Key words	particle-size of crystal, crystal shape, crystal structure, monodisperse, seed crystal addition, micro liquid droplet	

What kind of technology is this?

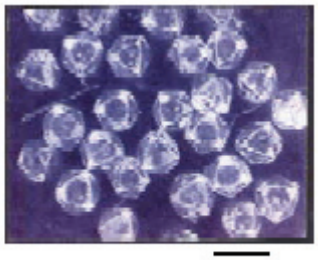
Outline

From several tens of nanometer size to millimeter size

High-value added crystalline chemical products such as medicines and fine chemicals are manufactured by crystallization method. However, it is very difficult to generate crystal particles having a similar size. In addition, it is more difficult to control their size. There are the following three particle-size control methods for monodisperse crystal: (1) Seed crystal addition method, (2) Poor solvent addition method, and (3) Liquid drop formation solvent evaporation method. Using these three methods, the author proposed the design of equipment and its operation method. With that design of equipment and the operation method, crystal particles having a size of 1000 μm to 100 nm were successfully manufactured.



5 μ m



1000 μ m

What are its applications?

In the field of material chemistry, it is very important to produce fine monodisperse crystals and control their particle size. Such demands are high. In drug industry, if fine particles can be manufactured, it becomes possible to produce fast-acting drugs because they can dissolve in the human body in a short time. In addition, in case of monodisperse particles, they can be dissolved at a specific location in the human body, reducing the demerit of possible side effects.

Related patents	
Related materials	J. Chem. Eng. Japan, 36, 1001-1004 (2003) Crystal Growth & Design, 4, 1, 103-107 (2004) J. Chem. Eng. Japan, 37, 436-442 (2004)

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