Preparation of monodisperse composite fine particles with the microreactor

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Monodisperse composite fine particles at nano size are prepared when we use the microreactor.

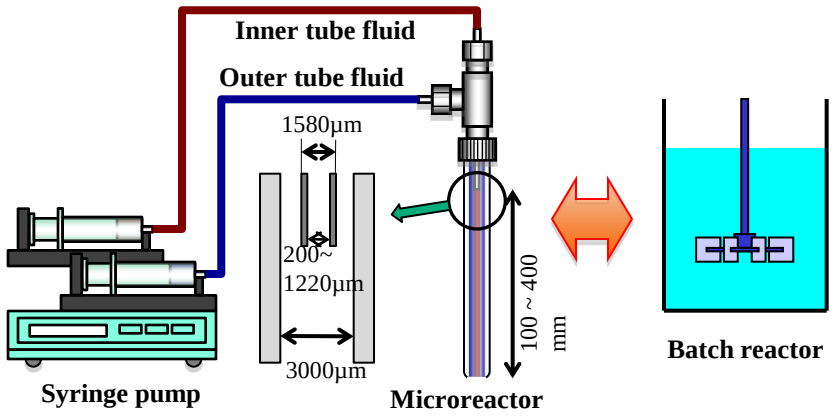
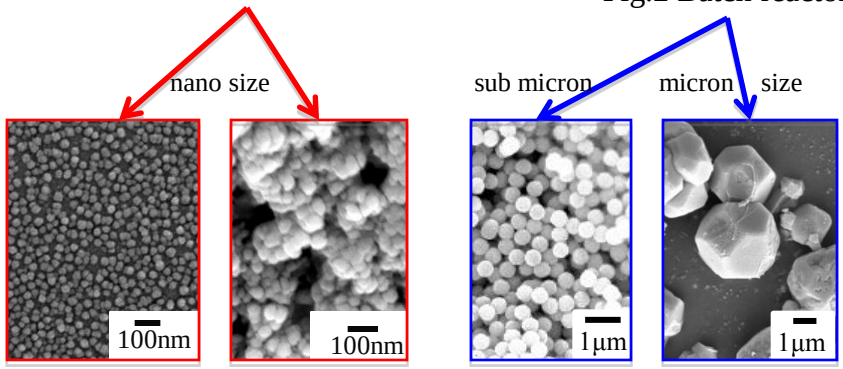


Fig.1 Concentric microreactor

Fig.2 Batch reactor



Monodispersed Co-Li-O particle

Cu + Cu_2O spherical particle

Monodispersed silica particle

Cu + Cu_2O polyhedral particle

Fig.3 SEM images of the products

Content:

In not only the single component but also multicomponent system, we can prepare monodisperse composite fine particles at nano size by carrying out the liquid phase synthesis such as the hydrolysis method of metal alkoxide or the deposition method with a concentric microreactor. Generated fine particles does not attach to a wall surface, because a reaction part is a double pipe. In addition, because it is a flow reactor, continuous synthesis is possible, and upsizing of the device (scale-up) is unnecessary by numbering up increasing the number of devices. We can prepare the functional nanoparticles including various kinds of elements, if we use this microreactor which can control a reaction precisely.

Microreactor is the flow reactor which size has microspace (a micro channel) of around 100 mm or less than it. The precise control of the quick mixture and reaction is possible, because a heating and a cooling rate are fast, a flow is a laminar, and the surface area per unit volume is large. **Monodisperse particle** is a particle without the cohesion, a shape is equal, and width of the distribution is narrow.

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