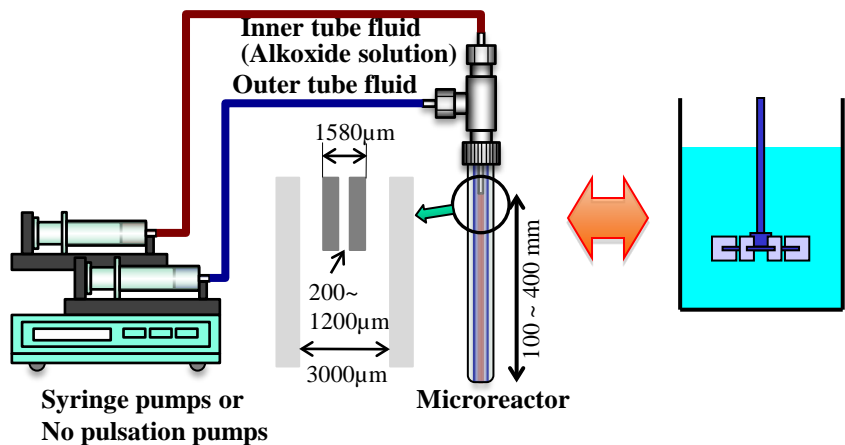


Preparation of the composite NP's with the multi-concentric microreactor

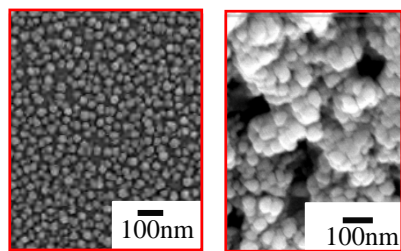
Professor Mitsumasa KIMATA

Concentric micro reactor (Liquid phase & continuously)

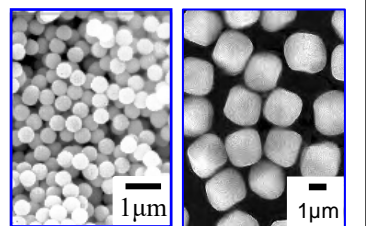
Batch reactor (Liquid phase)



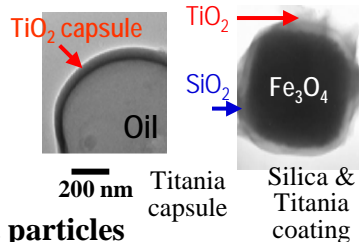
Nano size & Nanostructure



Nanosized lithium cobalt oxide particle
Copper + Cuprous oxide (Nanostructure)



Monodispersed silica
Hematite particle



SEM images of the product particles

Content: In our laboratory, we synthesize composite nanoparticles (NP's) in liquid phase using batch and concentric microreactors through methods such as metal alkoxide (sol-gel) and precipitation. By varying the type of reactor and combinations of materials, it is possible to change the particle size from nano to micro. This allows for the preparation of various particles including monodisperse nanoparticles, aggregated particles with nanostructures, coatings, capsule structures, and more.

Especially, the concentric microreactors developed in our lab allow for continuous assembly of nano particles. Employing techniques such as etching-up, maintaining microspaces within the device, and numbering-up by increasing the reaction unit count, these reactors adeptly cater to scaling up of the device.

Appealing point: The reaction involving multiple components using the metal alkoxide method allows us to exhibit even higher functionality compared to precipitation methods that generate bulk formations, by enabling composite formation at the molecular level. Our strength lies in our ability to control this reaction.

Yamagata University Faculty of Engineering
Research Interest : Chemical Engineering
Powder Technology, Reaction Engineering
E-mail : kimata@yz.yamagata-u.ac.jp
Tel : +81-238-3157
Fax : +81-238-3414



HP : <https://acebe.yz.yamagata-u.ac.jp/laboratory/>