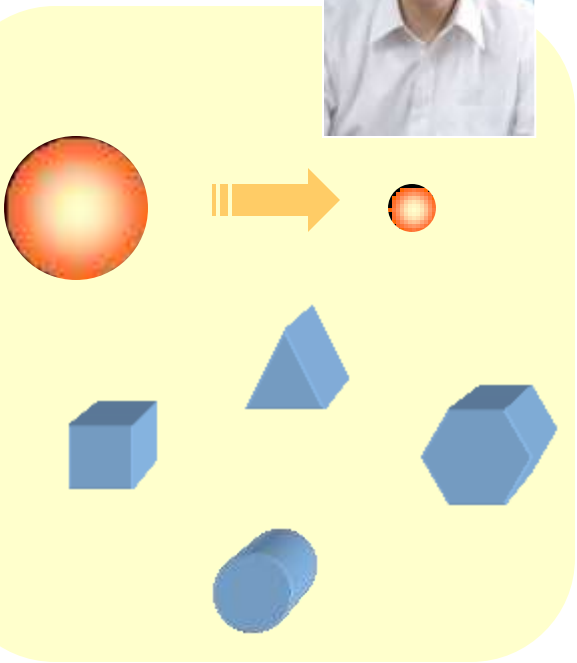
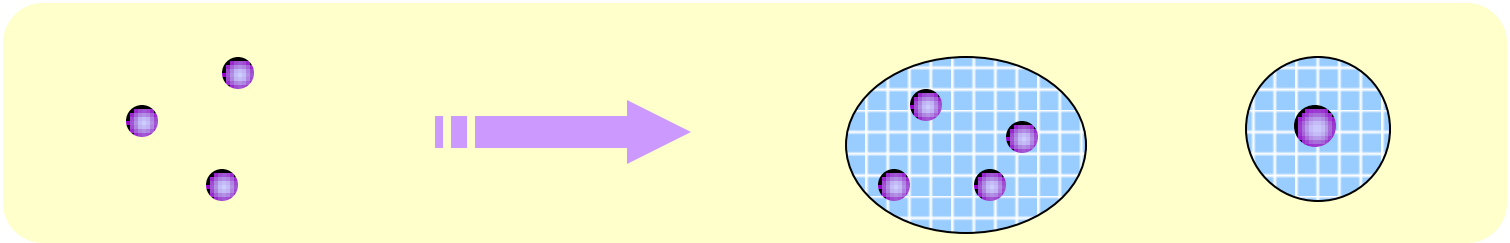
Synthesis of Ceria Nanoparticle-Assembled Hollow Mesoporous Silica Composite Particles

Mikio Konno Lab.

■Nano-sized catalysts

- Excellent performances
- Catalytic activities depend on size, shape, component, *etc.*
- aggregation and sintering reduce catalytic activities
- Mesoporous silica is a good support for high thermal stabilities, reusability, keeping high reactivity.



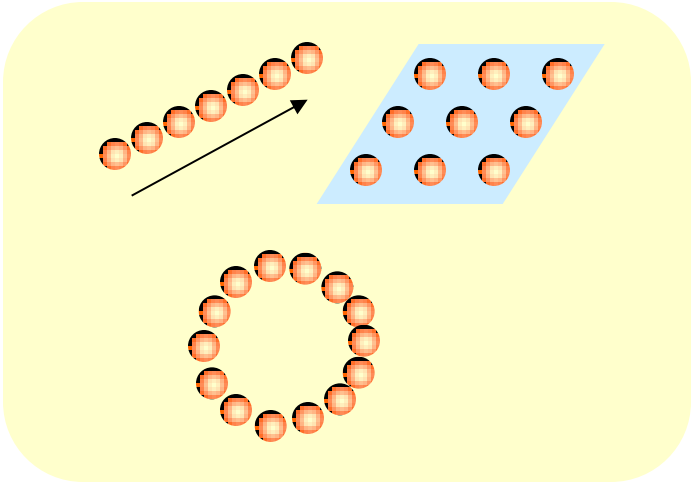


■Nanoparticle assembly

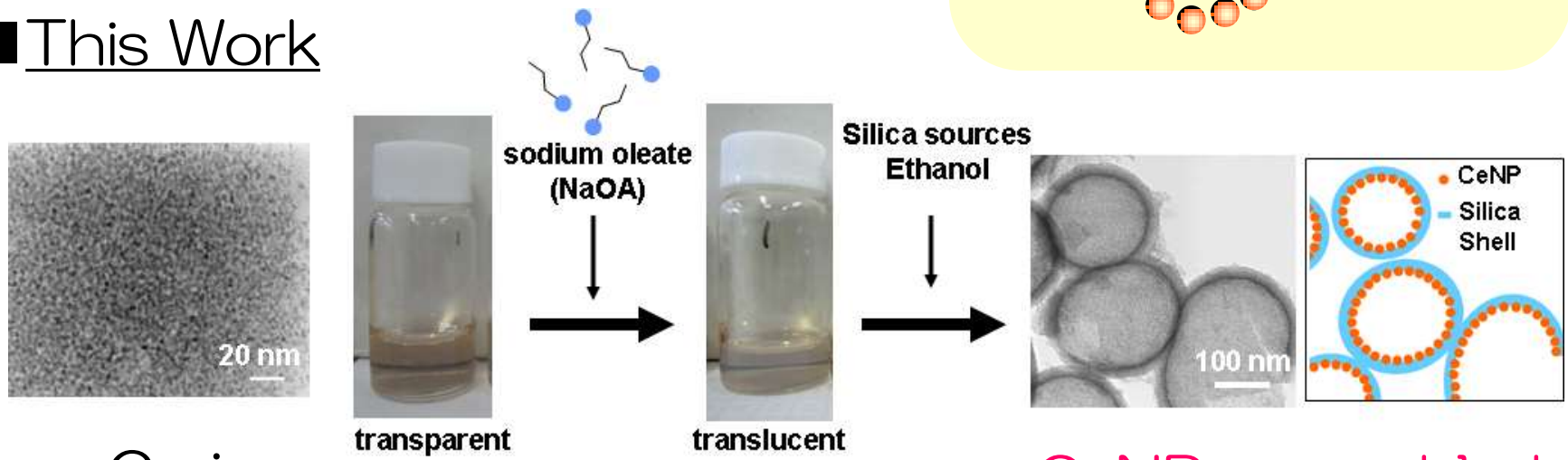
-Novel functions different from that of nanoparticles

-Nature of the assembly improves catalytic activity

-Reusable catalysts



■This Work



Ceria nanoparticles (CeNPs, *ca.* 3 nm)

CeNP-assembled hollow mesoporous silica particles

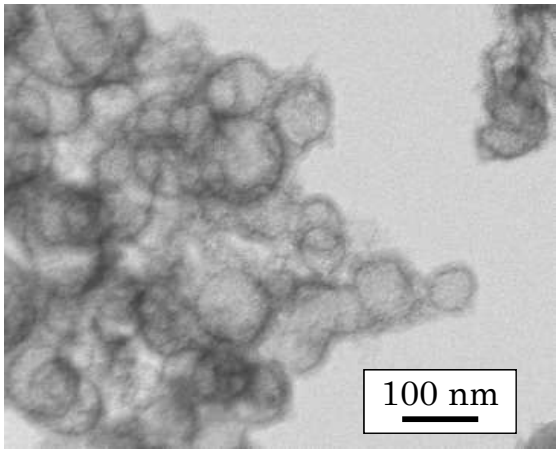
H. Ishii, S. Ito, D. Nagao, M. Konno, *Colloid Surf. A, in press*.

■Synthesized structures are

- pH- dependent

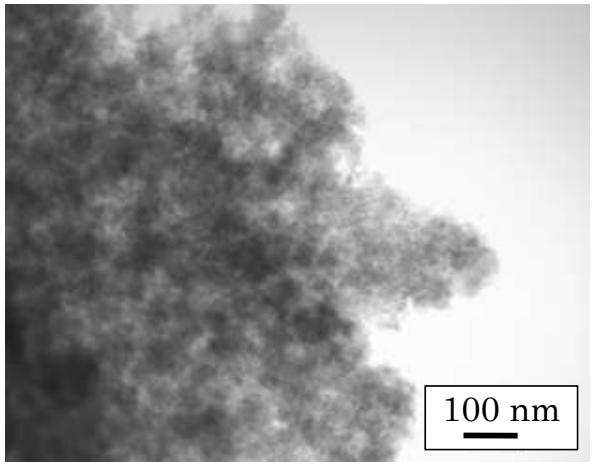
- Ce inside
  Si outside

7 < pH < 10

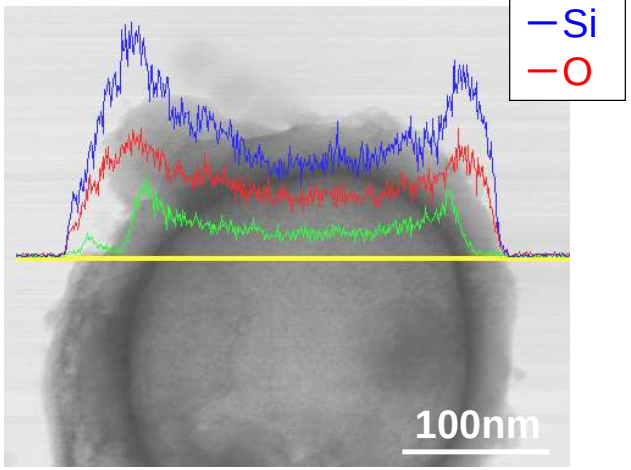


Hollow Particle

pH > 10



Aggregates



■Synthesized particles are

-thermally stable

-appllicable to automotive catalysts