

# Development of functional clay materials

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Exploring Function Field / Functional Clay Materials Group

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## Background

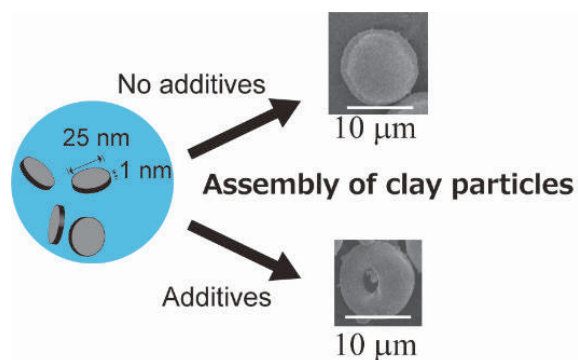
- Clay minerals are ubiquitous in natural environment.
- Clay minerals have a layered structure and have large surface area.
- Clay minerals have high affinity with water, ions, and organic molecules.

## Aim

- Development of materials using natural resources.
- Development of functional adsorbents utilizing the large surface area.
- Understanding the adsorption mechanism.

## Advanced Research Topics

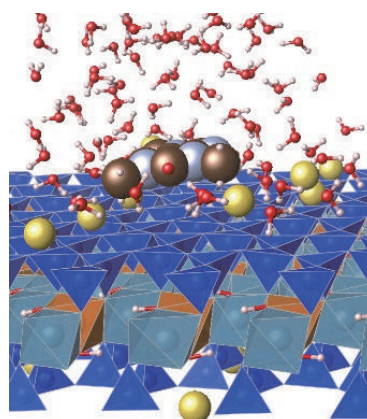
### Development of adsorbents for toxic elements



Clay nanoparticles ->  
Microparticles (Easy to use and safety)

### Analysis of adsorption sites

Surface X-ray scattering and  
molecular simulations



Efficient development of materials

## Publications

- H. Sakuma, K. Tamura, K. Minagawa, *Chemistry Letters*, **47**, 68-70 (2018).
- H. Sakuma *et al.*, *Clays and Clay Minerals*, **65**, 252-272 (2017).
- H. Sakuma, M. Ichiki, *Journal of Geophysical Research – Solid Earth*, **121**, 577-594 (2016).

## Summary

- Development of clay microparticles
- Modeling of clay surfaces
- Understanding adsorption mechanism of ions and organic molecules

## Research outcome

- Selective adsorption
- Reuse of adsorbents by a simple procedure
- Adsorption tests of various materials