

Sakoda LAB.

[Development of adsorbent and adsorption process for protection and improvement of environment]

Department of Materials and Environmental Science

<http://www.sakoda-lab.iis.u-tokyo.ac.jp/sakoda/index-sakoda.html>

Chemical
System
Engineering

Environmental and Chemical Engineering

Development of adsorbent and adsorption process for protection and improvement of environment

We are developing adsorbent and separation process for protection and improvement of environment, covering from low-cost and efficient to most advanced ones. Our goal is to develop truly effective combination of adsorbent and separation process by feedback of the information obtained in operation of testing apparatus at the target site.

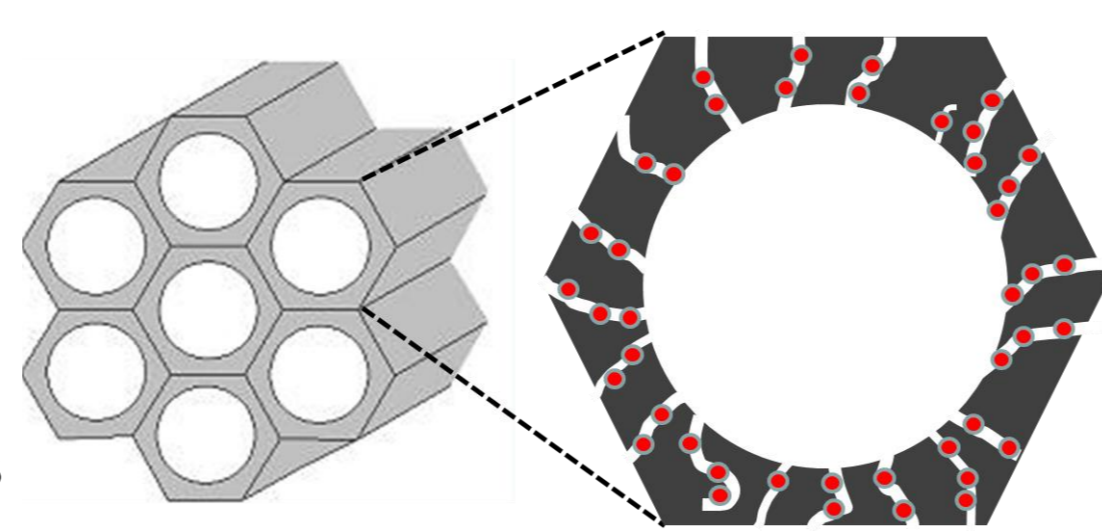
Structure control of adsorbent

■ Structure control of bamboo char



- ① Control of micropore inside the char
- ② Control of micropore aperture by mineral
- ③ Control of functional groups on the micropore surface

■ Biporous molecular sieve



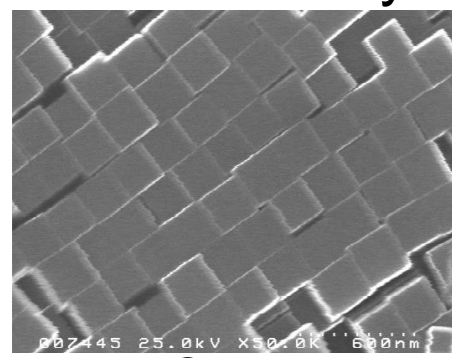
Uniform-sized micro- and mesopore

■ Structure control of prussian blue crystallite

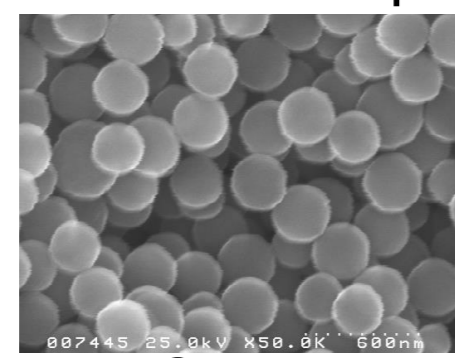
◇ Control of crystallite size and morphology

◇ Control of vacancy

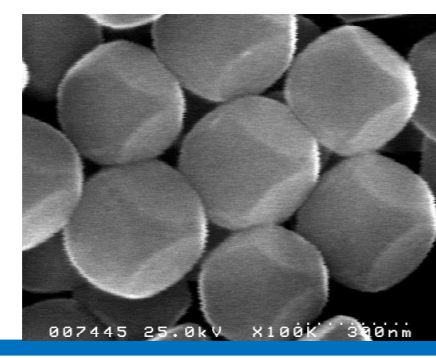
◇ Control of redox status



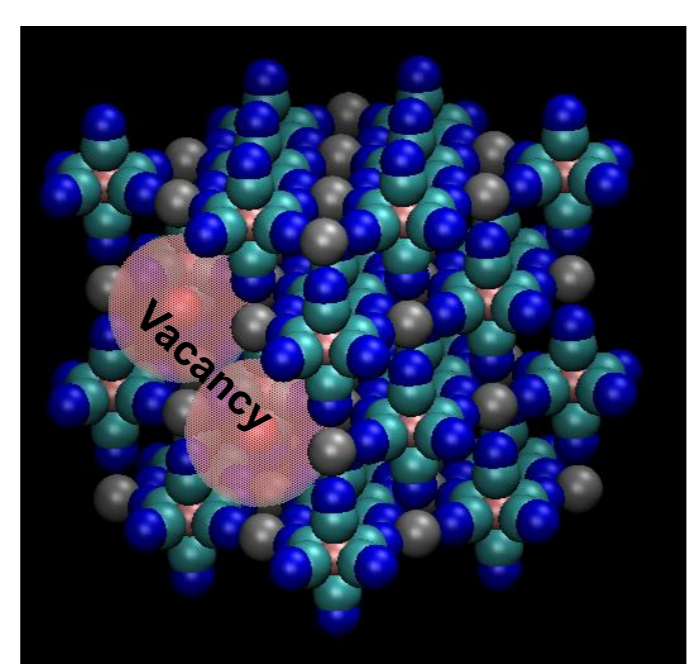
Cube



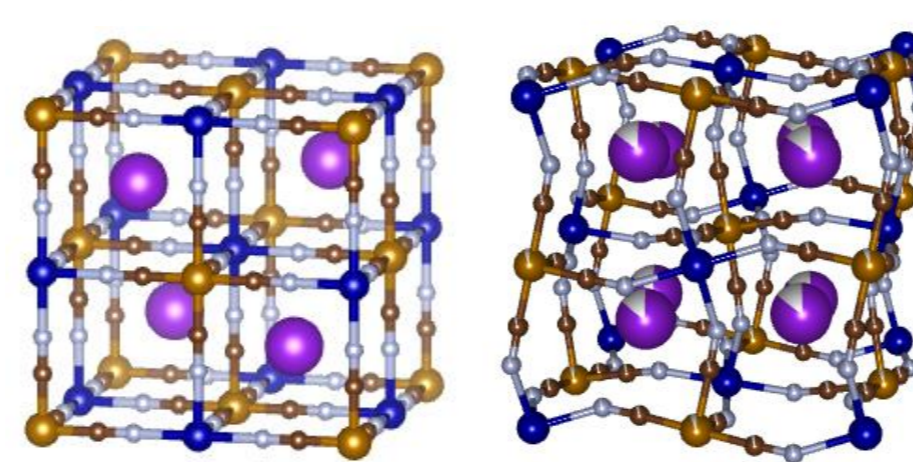
Sphere



Polyhedron

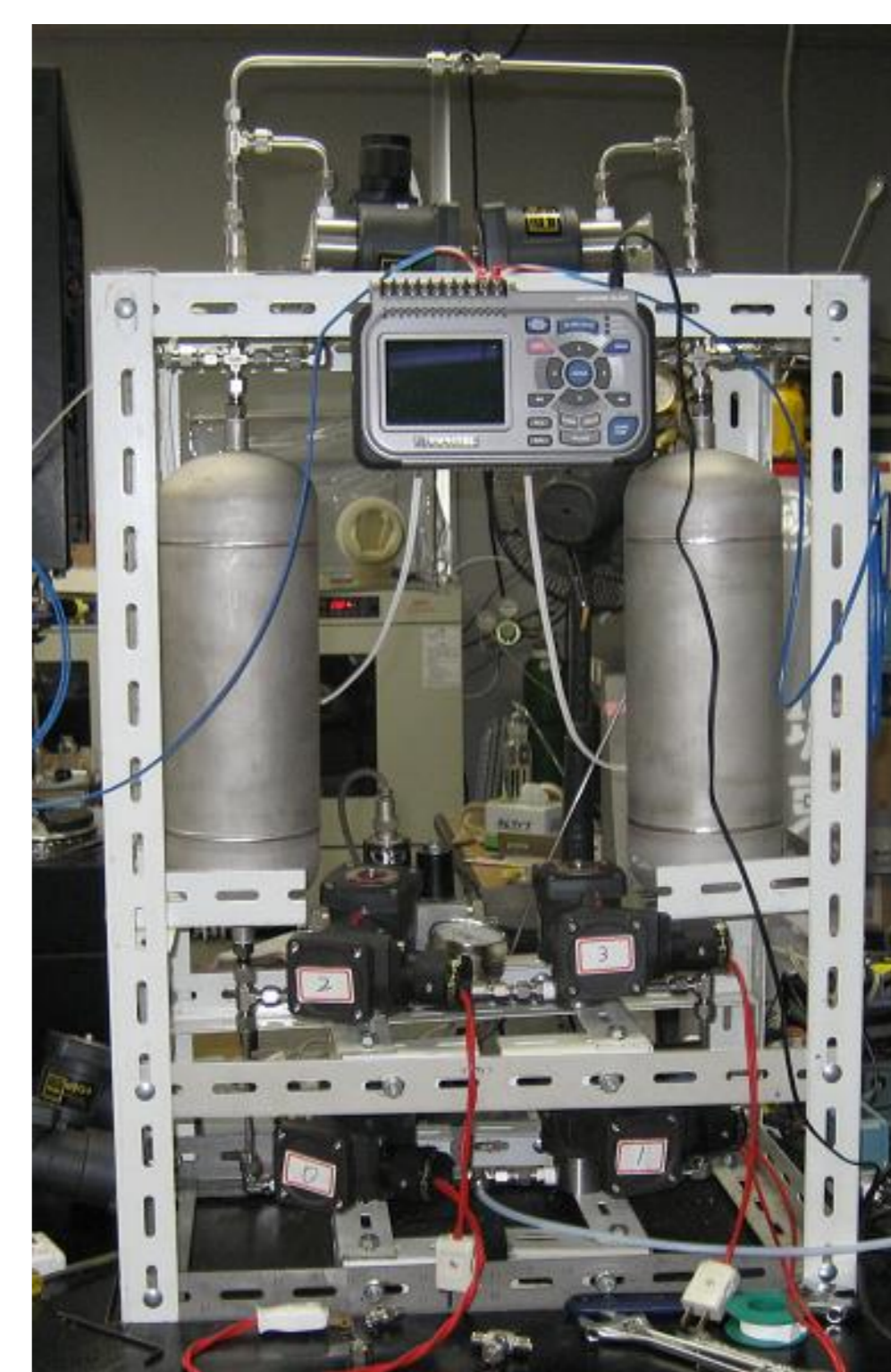


Vacancy



Application

Design and operation of adsorption process

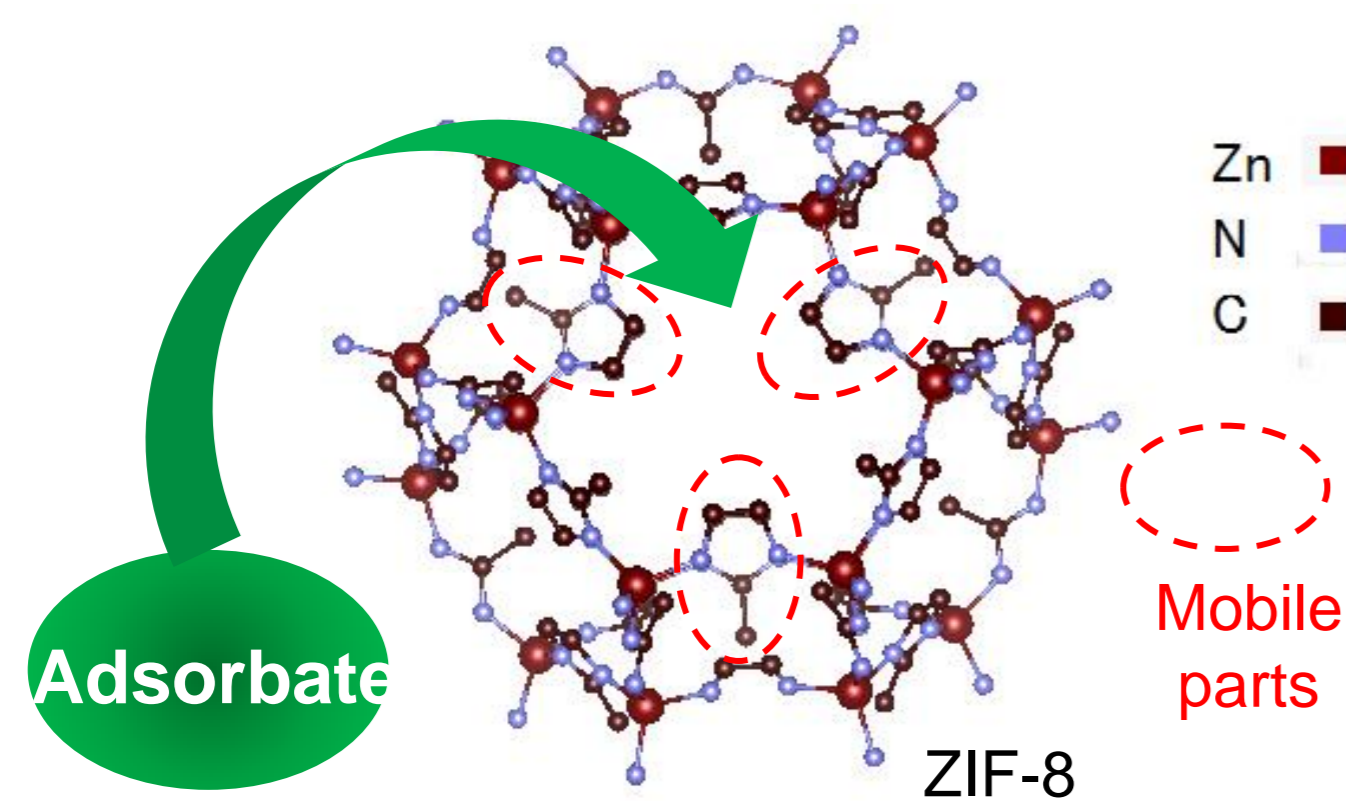


Separation of biogas using bamboo char by dual column PSA

Elucidation of adsorption mechanism

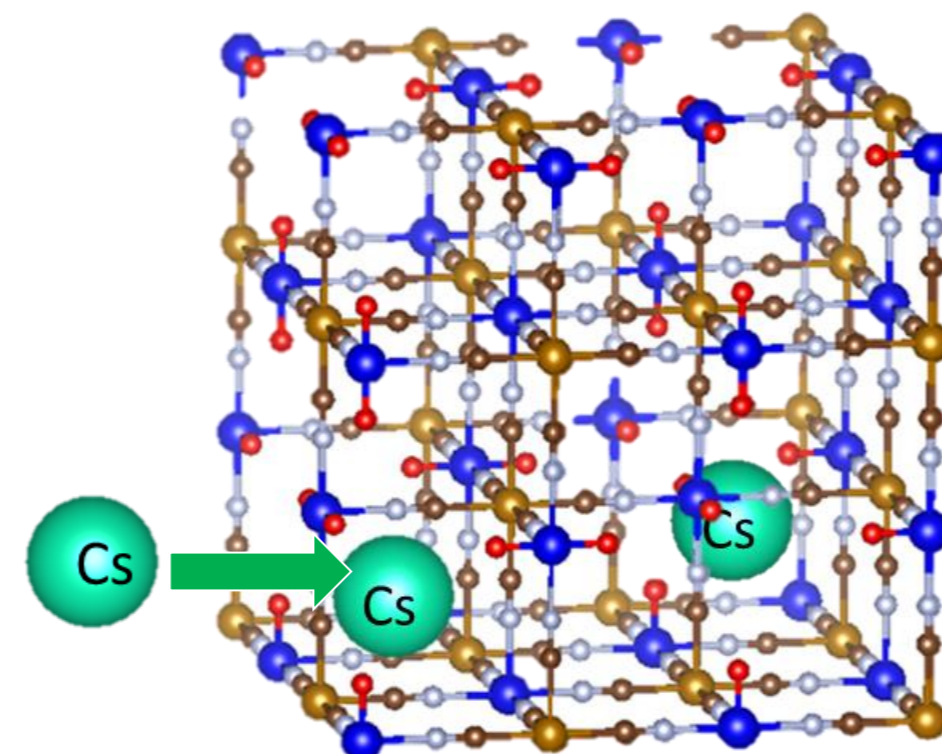
◇ Diffusion mechanism of adsorbate in MOF with structural flexibility

◇ Penetration mechanism of cesium into Prussian blue crystallite

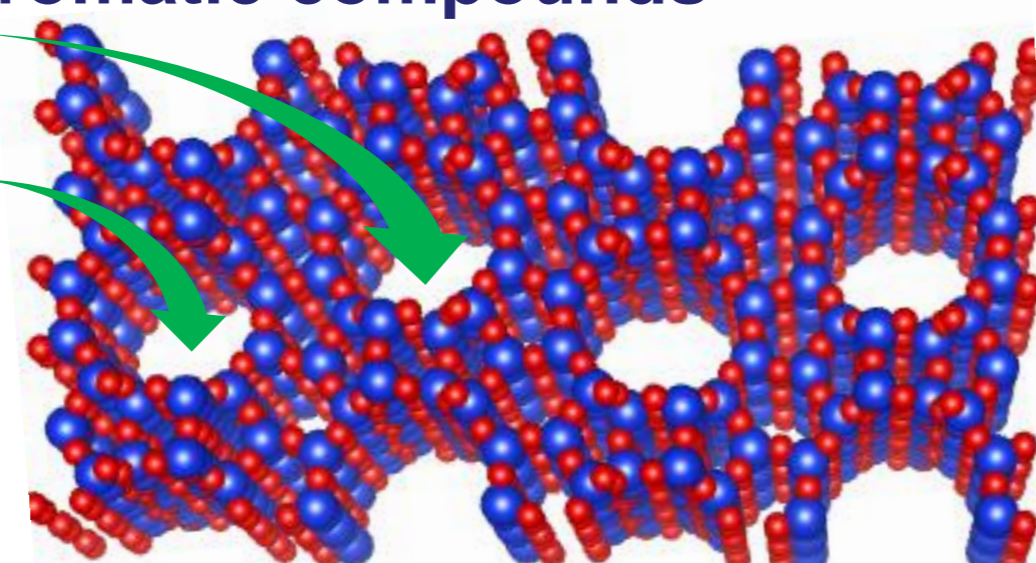
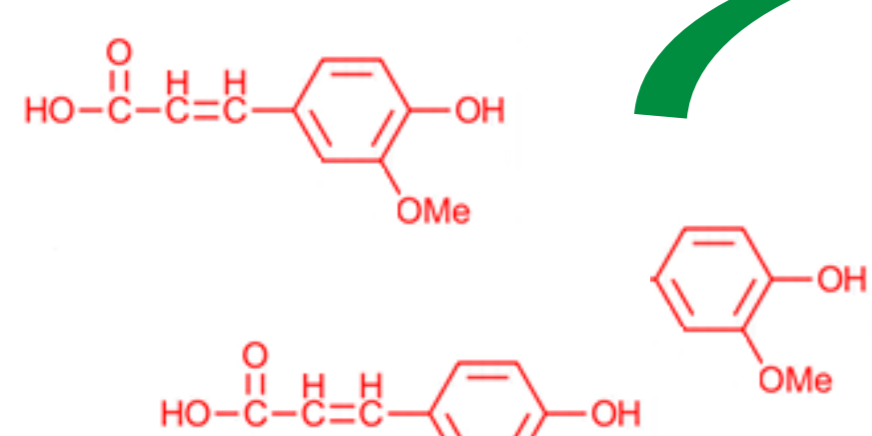


ZIF-8

Zn
N
C
Mobile parts



◇ Mechanism of difference in adsorption rate among lignin-derived aromatic compounds



Removal of radioactive cesium from soil by Prussian blue