

**CO₂ separation by adsorption
「Development of a new CO₂ adsorbent
for High pressure gas stream」**

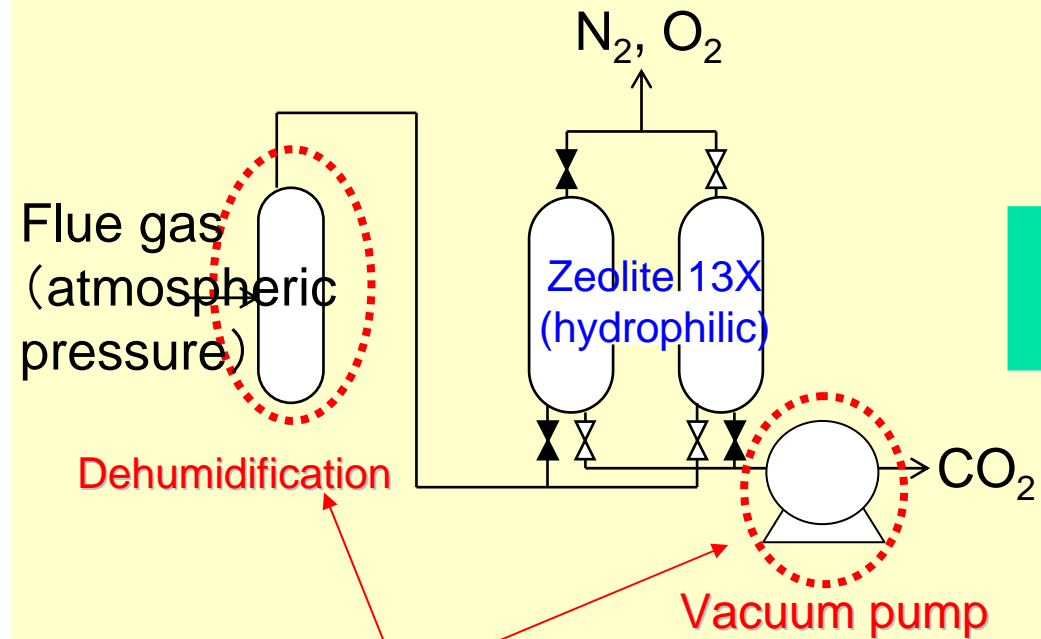
***Chemical Research Group
Research Institute of Innovative Technology
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Energy-saving CO₂-PSA

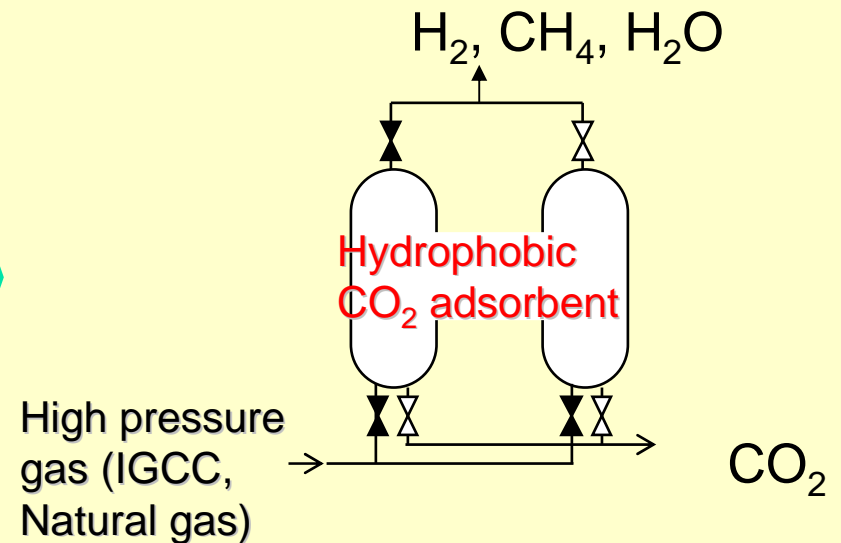
- A new CO₂ adsorbent for high pressure gas
→ process evaluation

Conventional ICO₂-PSA



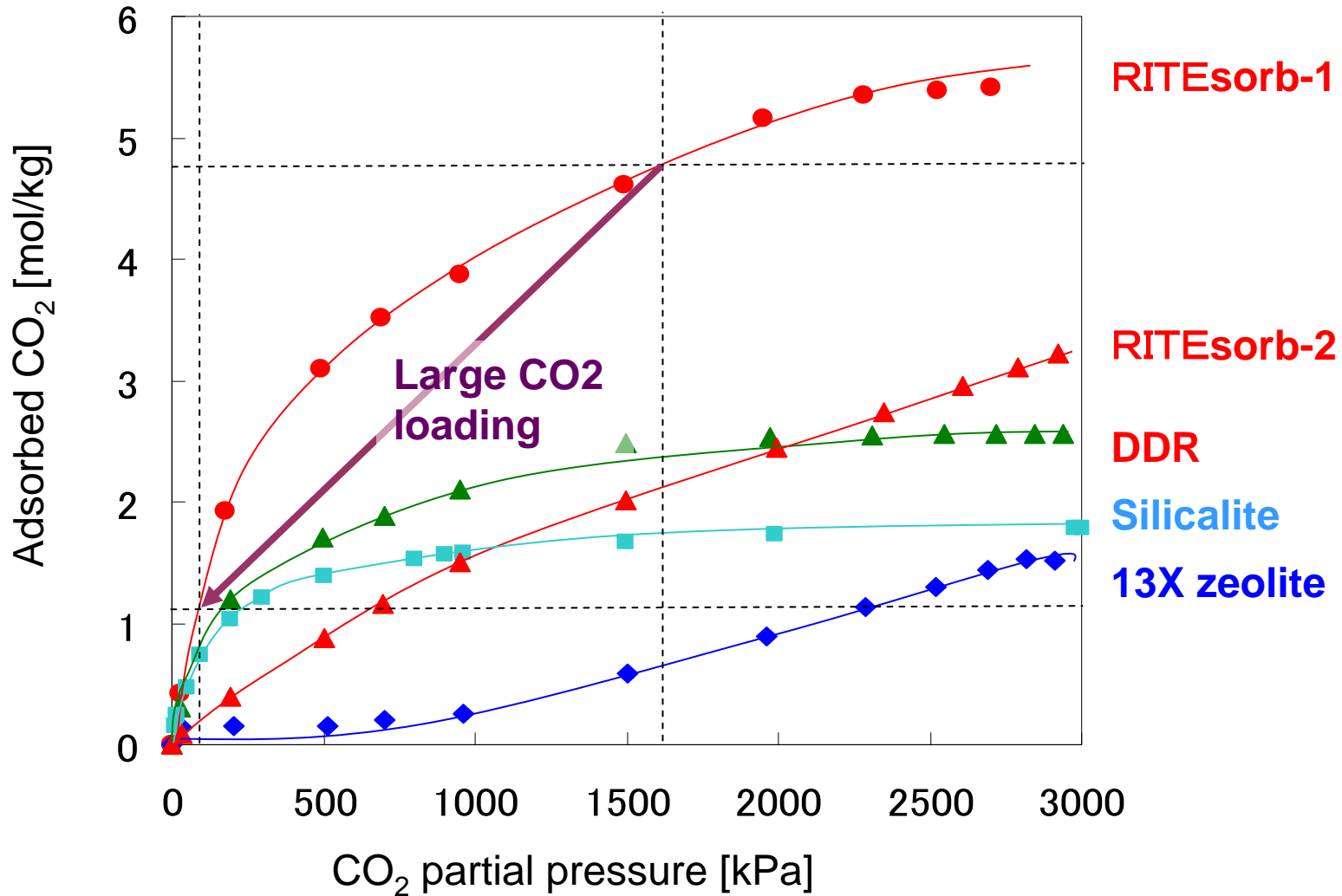
large consumption of energy

Energy-saving CO₂-PSA



The elimination of dehumidification step and vacuum pump save process energy

CO₂ adsorption capacity in the presence of water vapor (313 K)



RITEsorb-1 : Large CO₂ adsorption capacity : 3.6 mol/kg

Advantages of the PSA process

- Adsorption from high pressure gas stream
→ Vacuum pump unnecessary
- Hydrophobic adsorbent → Dehumidification unnecessary
- Running cost → Low (long life, chemical resistance to acids and alkalis)
- Environmental impact → post treatment of depleted toxic compounds unnecessary
- Dry process → corrosion countermeasure unnecessary
- Easy start-stop, unattended operation



Great potential for energy-saving CO₂ separation process (<1GJ/t-co₂).
Evaluation of the process cost is now in progress.