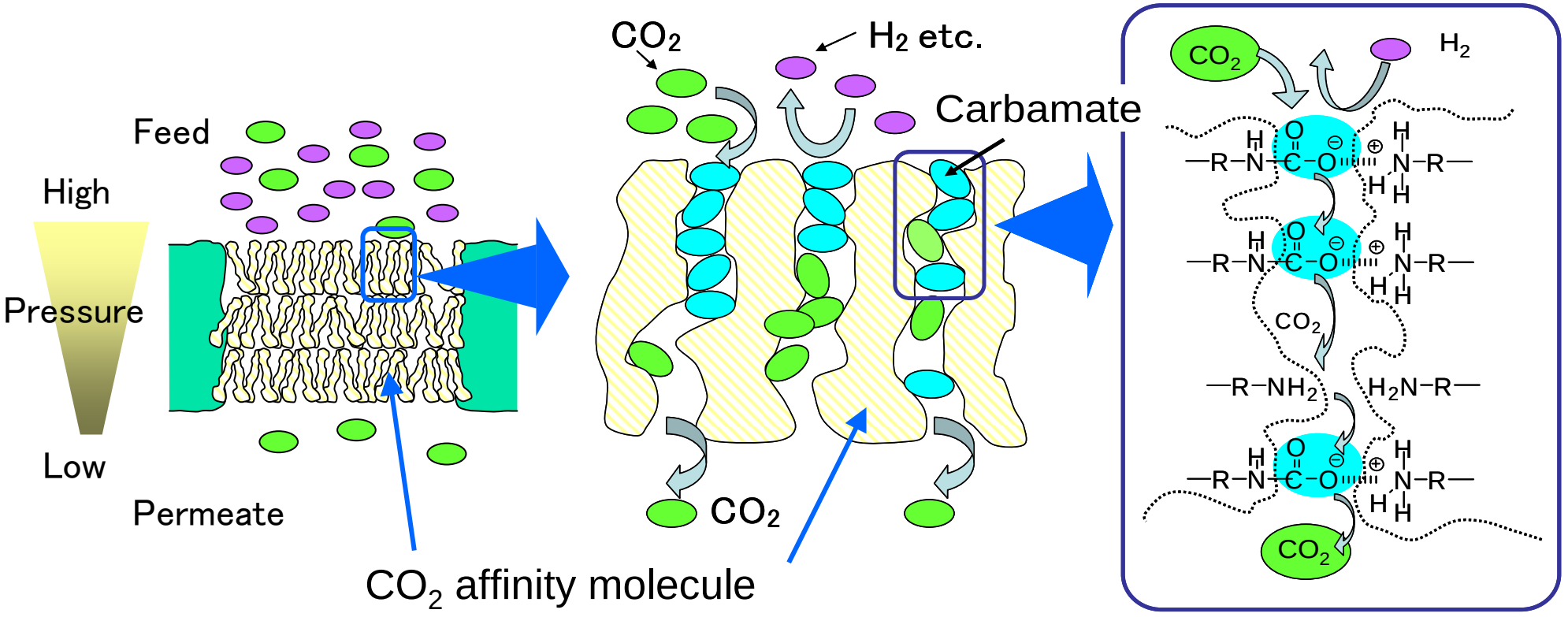
GCEP「Advanced CO_2/H_2 Separation Materials Incorporating Active Functional Agents」

GCEP（Global Climate & Energy Project）

Chemical Research Group
Research Institute of Innovative Technology for the Earth (RITE)

Concept of molecular gate membrane



(a) CO_2 affinity molecules in macropore

(b) General concept

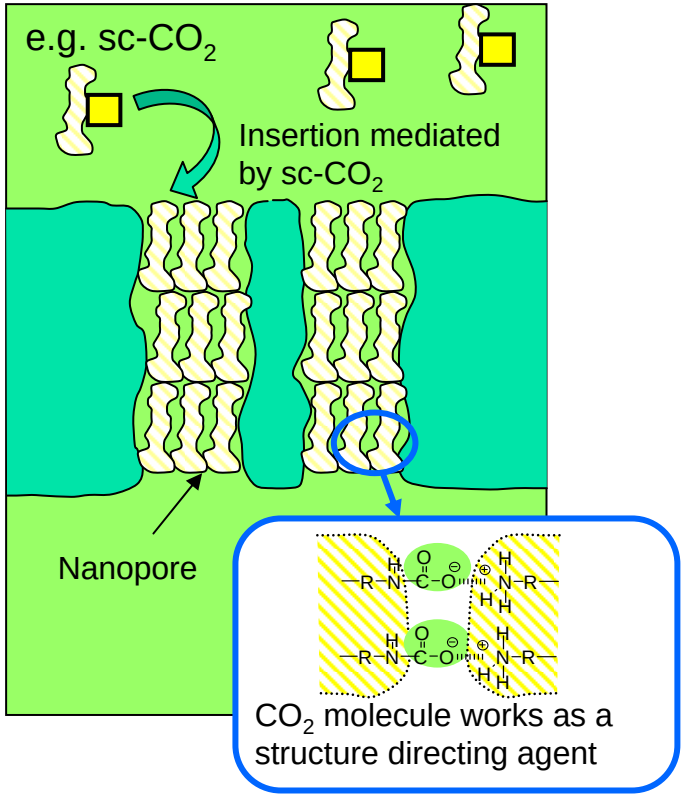
(c) In the case of amine compound

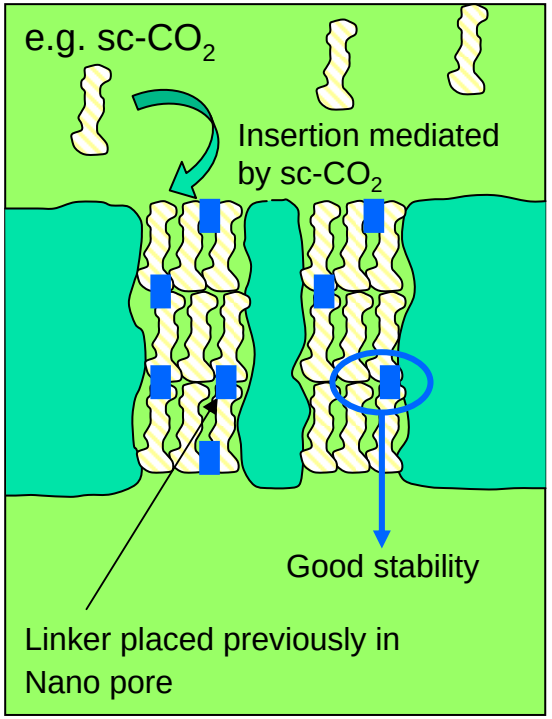
Concept of membrane preparation technology using sc-CO_2

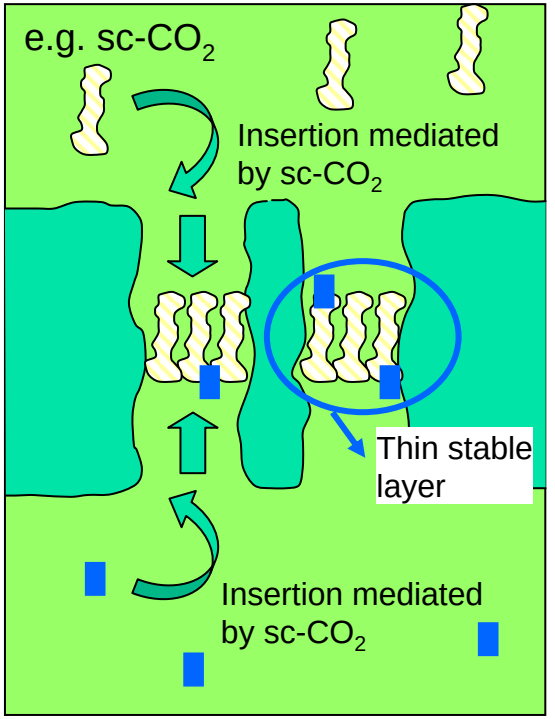
(a) Insertion of CO_2 affinity Molecule into nano pore

(b) Reaction of CO_2 affinity molecule with linker previously placed in nanopore

(c)Interfacial Reaction of CO_2 affinity molecule with linker







Molecule with large CO_2 affinity

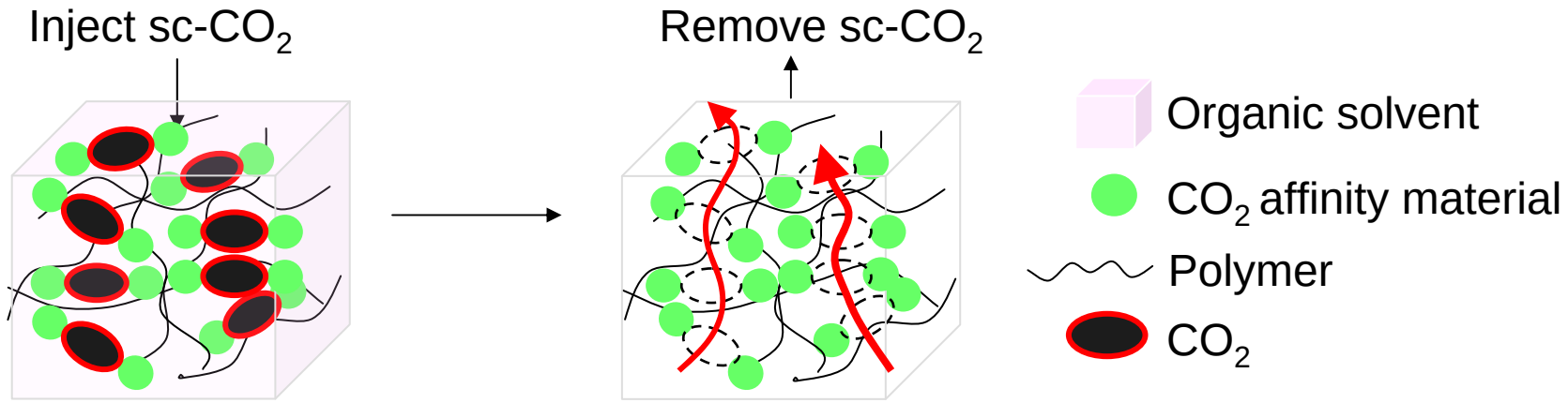
Solubility enhancer

Linker of CO_2 affinity molecule

Example of membrane preparation technology using sc-CO_2

RITE Research Institute of Innovative Technology for the Earth

GCEP（Global Climate & Energy Project, Stanford University）

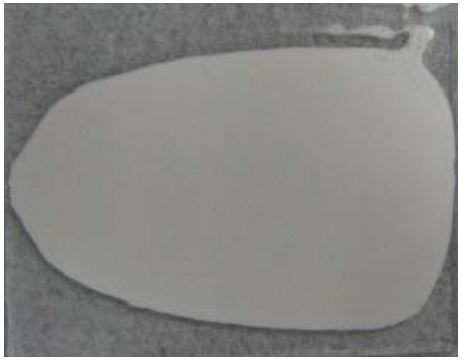


A. Inject sc-CO_2

Formation of suitable membrane structure by interaction with CO_2 affinity material

B. Remove sc-CO_2

Keep moderate distances of CO_2 affinity materials



【PAMAM-Cellulose acetate membrane】

Solvent removal from PAMAM/Cellulose acetate/Solvent (NMP) by sc-CO_2