

Containment

Trapping mechanisms involve both physical and geochemical factors:

- Physical trapping mechanisms related to basin-scale processes:

- regional structure, basin history and pressure regimes

- Physical trapping mechanisms related to geometry of traps:

- controlled by rock architecture of the storage complex

- Physical trapping mechanisms related to fluid flow processes:

- Capillary interfaces between fluids


- Retention of CO₂ as a residual phase

- Geochemical trapping mechanisms:

- CO₂ dissolution in brine

- CO₂ precipitation as mineral phases

- CO₂ sorption/absorption (e.g. on clay minerals)



Structural and
Stratigraphic
trapping

Increasing storage security over time

- The IPCC special report (Metz et al. 2005) argued that the various CO₂ trapping mechanisms would work over time to increase storage security in the long term:
 1. Structural and stratigraphic trapping
 2. Residual CO₂ trapping
 3. Solubility trapping
 4. Mineral trapping
- Longer term processes – residual solubility and mineral trapping – should gradually work to “fix” CO₂ permanently in the subsurface

