

Advanced Structured Adsorbent Architectures for Transformative CO₂ Capture Performance

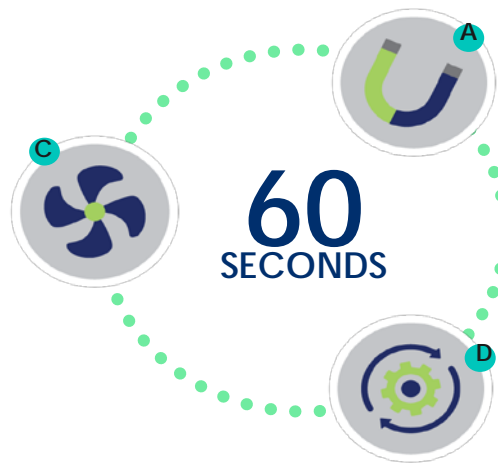
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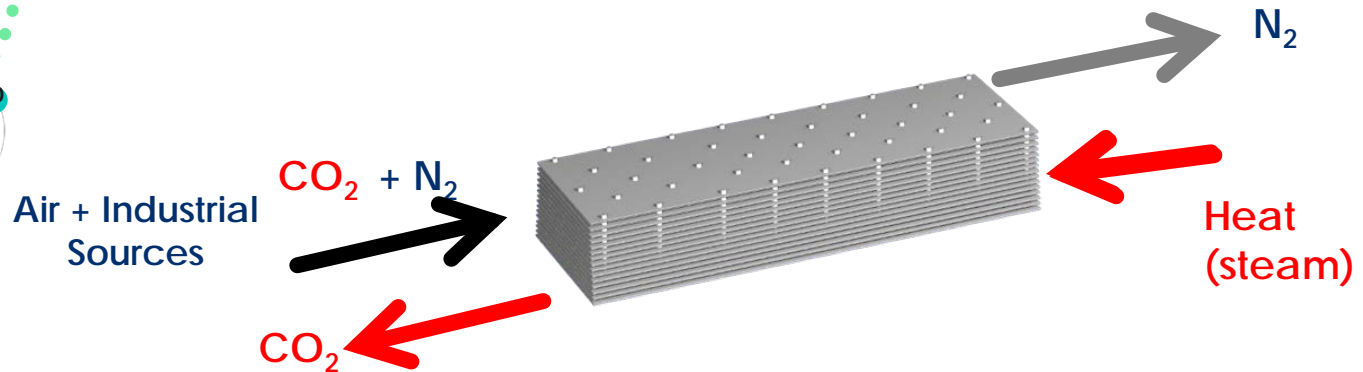
Principal Investigator: Ms. Deborah Jelen



Inventys Carbon Capture Technology RC-TSA



Engineered CO₂ filter
Structured Adsorbents with thermally conductive matrix
enable Rapid Cycling TSA process (RC-TSA)



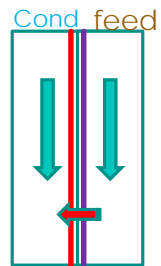
Concept

Use new engineering design to create an advanced structure adsorbent to

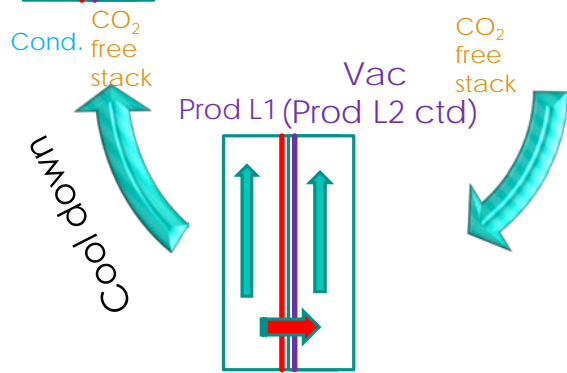
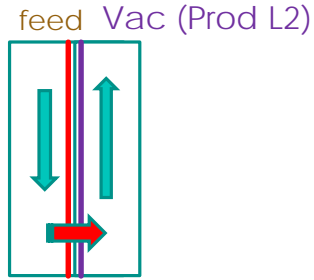
- Optimize thermal management in Thermal Swing Adsorption
 - Enable synergistic design and reduced amount of steam injection into the system.
- Create two different regeneration environments
 - Potential for increased capacity with high capacity sorbent material with fast regeneration.
 - Increase material choice
- Expand the material choice to non-steam stable adsorption material (ex. MOF)
 - Part of the sorbent can have lower heat of desorption and use the heat generated in the other sorbent w/o using hot steam as a carrier gas
 - Part of the sorbent can still use steam assisted desorption.

Bi-layer Cycle Design Example

Step 1 (B ads)



Step 2 (A ads/ B desorption)



Steam

Step 3 (A desorp/B desorp)

Layer A:

- Steam compatible
- High heat of adsorption (>70kj/mole)
- Water promotes CO₂ ads
- Fast kinetic

Layer B:

- Low CO₂ heat of desorption (<40kj/mole)
- Air stable up to 120°C
- Stable to feed moisture content
- Fast kinetic