

Fine Silica for Carbon Capture

SOLESPHERE™ microspherical silicas are excellent CO₂ absorbers when coupled with an amine treatment. The combination of particle size and porosity provides a solid base for amine treatments to absorb CO₂.

Features

- CO₂ capture & release with lower energy consumption
- Particle size and porosity range (e.g., large pore volume)
- Uniform spheres with sharp distribution

Benefits

- CO₂ negative emission / Air purification
- Higher absorbing/desorbing properties compared to the conventional technologies (energy saving)

Applications

SOLESPHERE can work as superior solid sorbents in applications including:

- Point source carbon capture
- Direct air carbon capture (DAC)

SOLESPHERE Silica Grades for Solid Sorbents

Choice of high- or low-surface-area grades, with large pore volume.

	H-53	L-52	L-123	DM-L-303
Mean particle size (µm)	5	5	12	35
Specific surface area (m ² /g)	700	300	300	300
Pore volume (ml/g)	1.8	1.6	2.0	2.2
Pore diameter (nm)	20	40	50	65



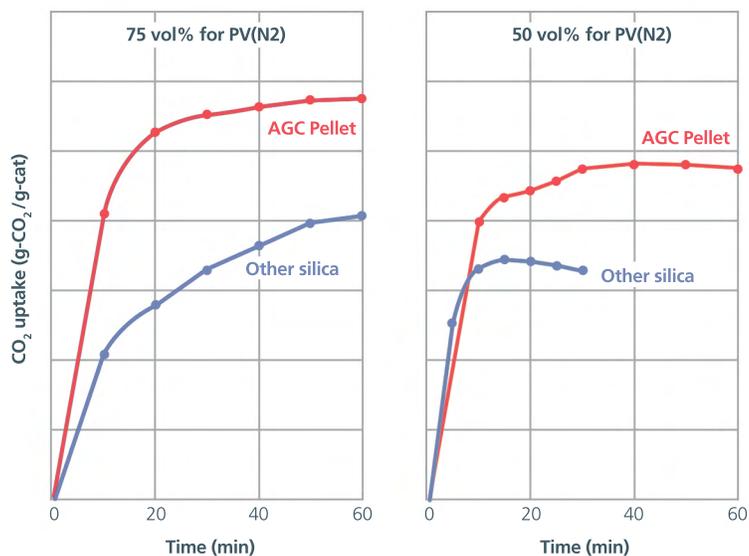
CO₂ Adsorption Performance

With its unique pore structure, SOLESPHERE silica contributes to the adsorbent's performance. Its benefits are clearly shown when compared with other materials using the same amine.

AGC Pellet (3 mm) vs Other Silica Powder (3 mm)

(comparison as carrier using same amine)

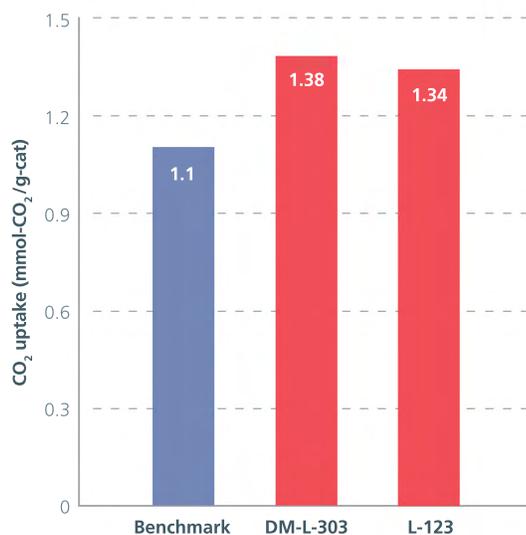
Conditions: 10% CO₂ concentration



Comparison of Silica Supports for CO₂ Adsorption

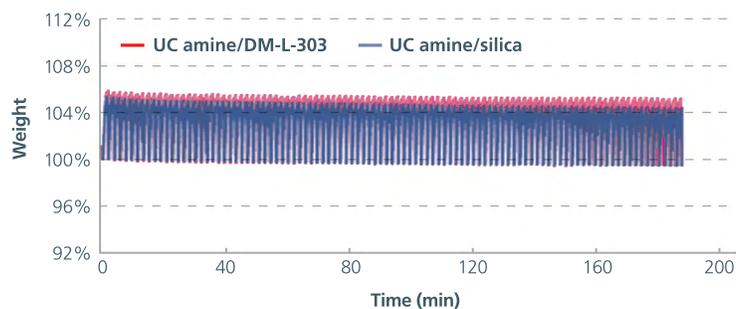
(test results from University of Cincinnati)

Conditions: 25 ml/min, 400 ppm CO₂, 30 °C, 50% (wt) loading



Stability and Compatibility with Amine

(tested with UC original amine)



TGA conditions:

Sample weight = ~4 to 5 mg with 50% (wt)
Substrate: UC silica and DM-L-303
Adsorption: 400 ppm CO₂ in Air (Dry) at 30 °C, 90 min
Desorption: Under pure N₂, 5 min
Desorption temperature: 90 °C
100 cycles



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