



APPLIED  
CATALYSTS +  
TECHNOLOGIES

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# Case Studies in Commercializing Catalytic Technology

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SOCMA March 2026



# OUR FOUNDATION

## Who We Are

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- Private, family-owned
- Created from Applied Ceramics, Inc
- Specialized in scaling new & commercial technologies
- Multiple US manufacturing sites
- Global partner network
- 130 skilled employees

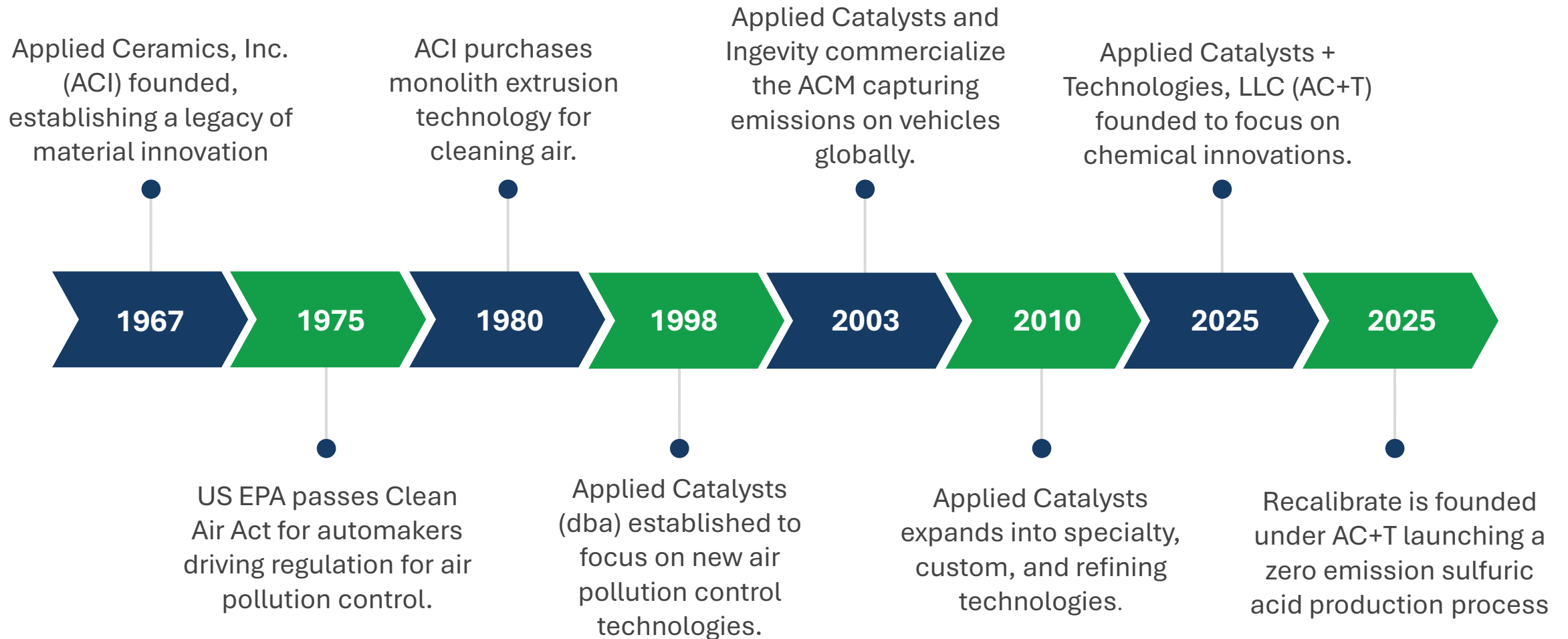
## Core Values

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- Kind Excellence
- We Create Value
- Disciplined Innovation
- Integrity Everyday



# DECADES OF EXCELLENCE





# TECHNOLOGY PIPELINE



**Working at all stages to commercialize client catalyst and process technology**



# ISO 9001 FACILITIES



**Laurens, South Carolina USA**  
85,000 ft<sup>2</sup>



**Doraville, Georgia USA**  
100,000 ft<sup>2</sup>

# INDUSTRIAL ASSETS



Rotary Calciner

- Agitated Vessels (Wet Chemistry)
- Extruders
- Rotary Calciner
- Tunnel Kilns
- Periodic Kilns
- Filter Press(s)
- Ball Mills
- Industrial Dryers
- Centrifuge(s)
- Solid Mixers
- NOx Scrubber
- Flare



# PILOT AND LABORATORY ASSETS



## Piloting Space

- 4000 ft<sup>2</sup>
- Show Tube Capacity (Flow Chemistry)
- Extruder
- Solid Mixers
- Liquid Mixers
- 50L Nutsche Filter
- Filter Press

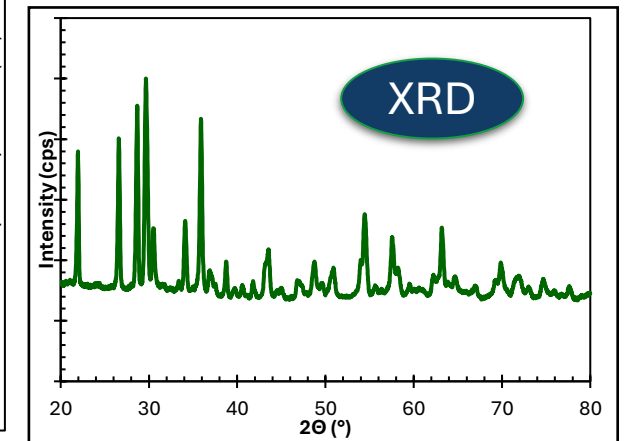
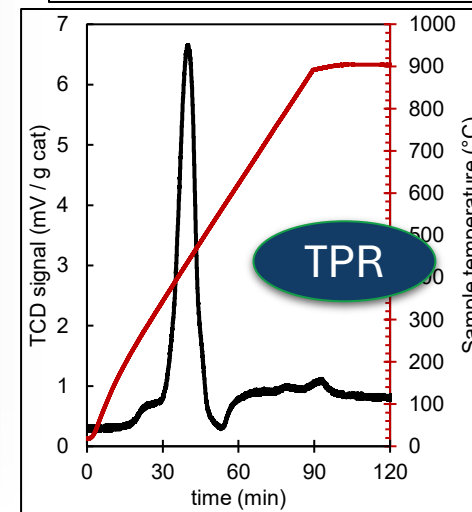
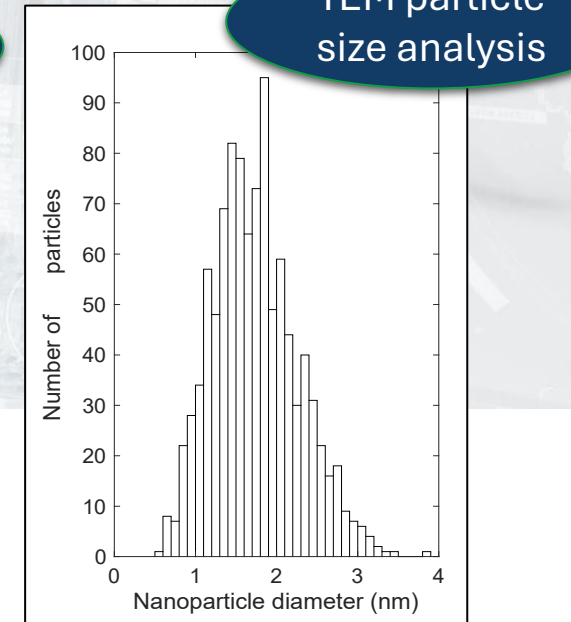
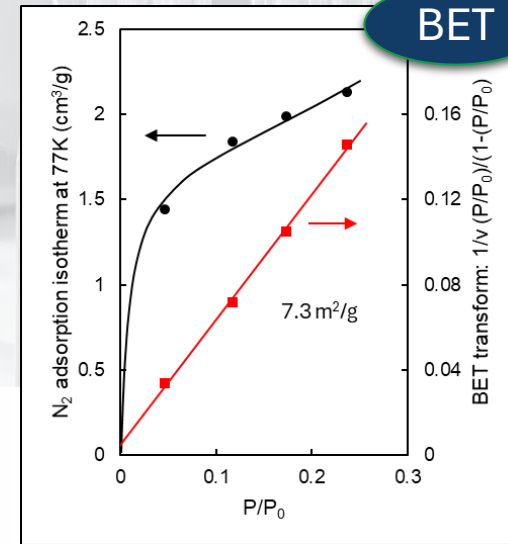
## Lab Space

- 2000 ft<sup>2</sup>
- Flow Reactors
- Batch Reactors
- High Throughput Screening
- Glass Reactors
- Fluidized Bed Reactor
- Extruder



# MATERIALS CHARACTERIZATION

- BET Surface area ( $N_2$ , Kr)
- Temperature programmed studies (TPR, TPO, TPD)
- Pulsed Chemisorption
- Static Chemisorption (Base metals)
- Particle Size (Laser light scattering, sieve stack)
- Electron Microscopy (SEM, TEM)
- In-Situ XRD
- Powdered X-Ray Diffraction (XRD)
- X-Ray Photo Electron Spectroscopy (XPS)
- Mercury Porosimetry
- Mass Spectroscopy
- Flame Atomic Adsorption
- ICP-OES
- Crush Strength





# CATALYST OFFERINGS

## Primary Offerings

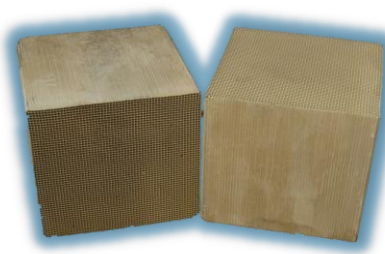
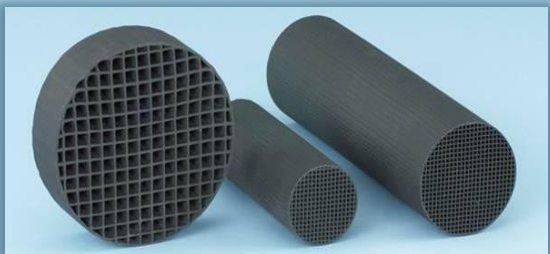
PGM Packed Bed Series



## Secondary Offerings

Activated Carbon Monoliths

Ceramic Monoliths



## Manufacturing Industrial Quantities

- Contract manufacturing
- Beaded packed bed
- Extruded packed bed
- Powered slurry
- Sponge
- Carbon monoliths
- Ceramic monolith
- Custom catalysts

# EQUIPMENT OFFERINGS

## LAB



Example:  
20 bar, 300 °C  
316 Stainless  
Stirred Autoclave

## PILOT



Example:  
20 bar, 700 °C  
C276 Hastelloy  
Hydrofluoric Acid Service

## PRODUCTION



Example:  
20 bar, 250 °C  
316 Stainless  
Continuous Hydrogenation

- EPC
- Batch Reactors
- Flow Reactors
- Nutsche Filters
- High Ni Alloys
- Stainless Steel



# CASE STUDIES

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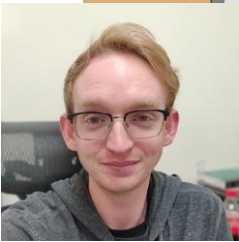
Commercializing Technology



# (1) Contract Manufacturing of a Proprietary Extrudate

## Problem Statement

Contract manufacture a discontinued catalyst for industrial assets in operation. Catalyst substrate was also discontinued requiring validation of an alternative.



**Ford Jolly**  
Chemist I

## Conclusion

Applied Catalyst identified several raw material suppliers & conducted pilot campaigns for performance.

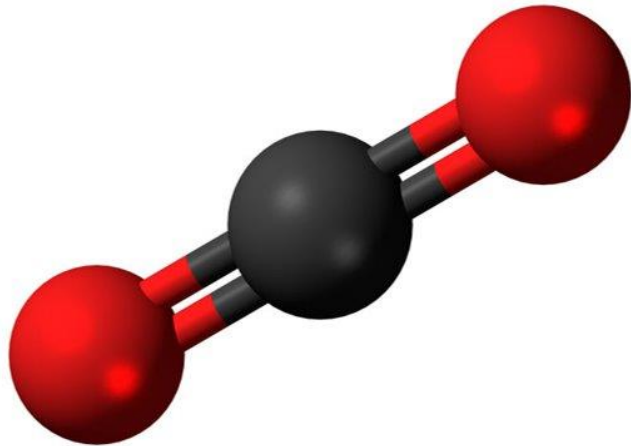
Currently implementing manufacturing of industrial quantities.



# (2) Contract Manufacturing a Proprietary CO<sub>2</sub> Adsorbent

## Problem Statement

Develop a process for contract manufacturing CO<sub>2</sub> adsorption media.



**Hunter Brown**  
Chemical Engineer II

## Conclusion

Lab, pilot, and precommercial production campaigns were completed.

Customer is evaluating 45 Mt of material from precommercial trials.

A commercial scale process has been designed to produce 225 Mt/year. Implementation pending approval.

# (3) High Throughput Screening for Naphtha Reforming

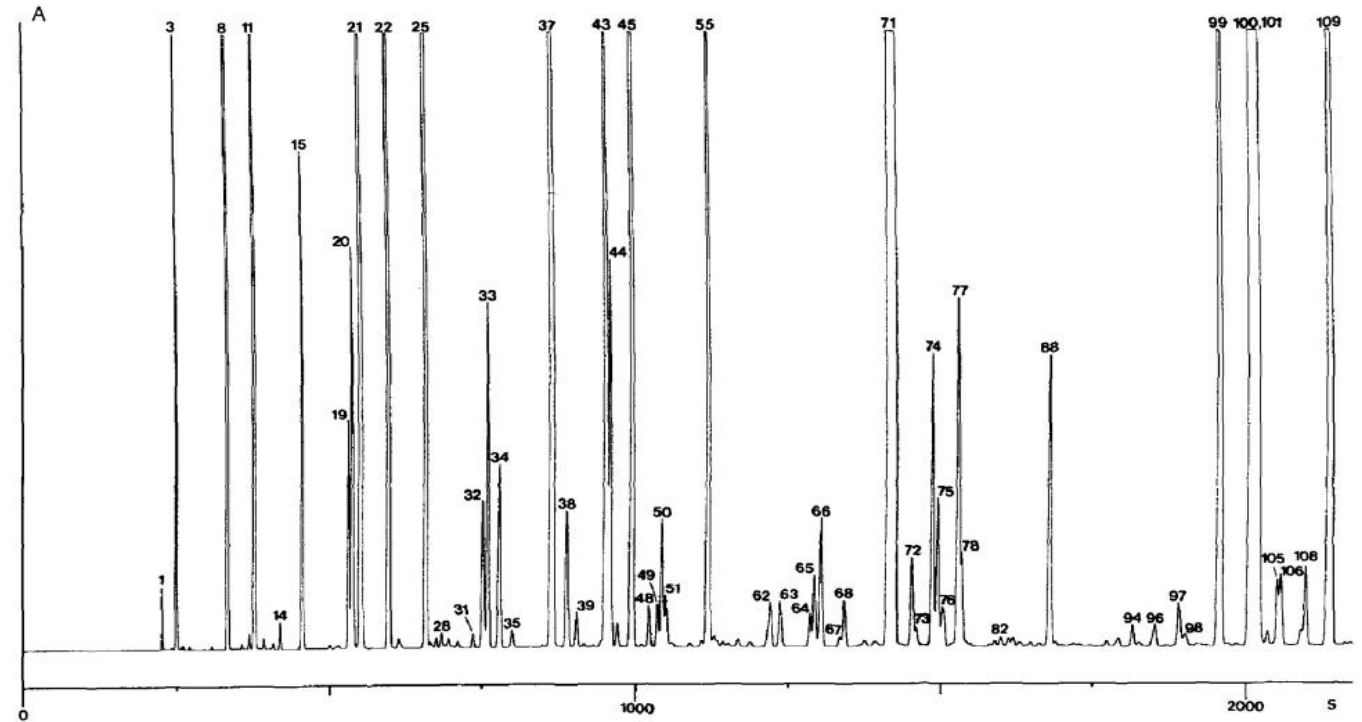
## Problem Statement

Develop a methodology for catalyst design with complex reaction networks.

## Background

Commercial naphtha reformers decrease engine knock by selectively upgrading a mixture containing ~300 hydrocarbons.

Operators target increased research octane number (RON) without sacrificing C5+ yield.



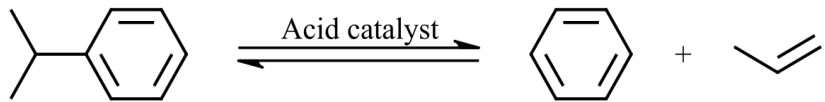
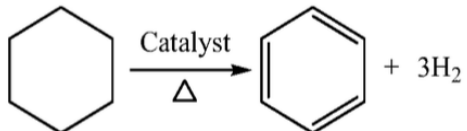
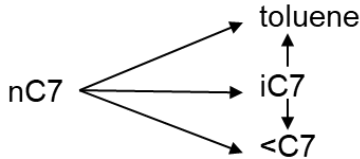
Partial chromatogram for a naphtha reforming stream. Note the complexity of the peak distribution.



## (3) Materials & Methods

### Strategy

Use three representative reactions to optimize specific chemistry.

Reaction	Chemistry	Active Site	Description
Cumene Cracking		Acid Site Catalyzed	Undesired
Cyclohexane Dehydrogenation		Platinum Site Catalyzed	Selective
Heptane Isomerization		Acid / Platinum Balance	Selective

# (3) Results

## Result

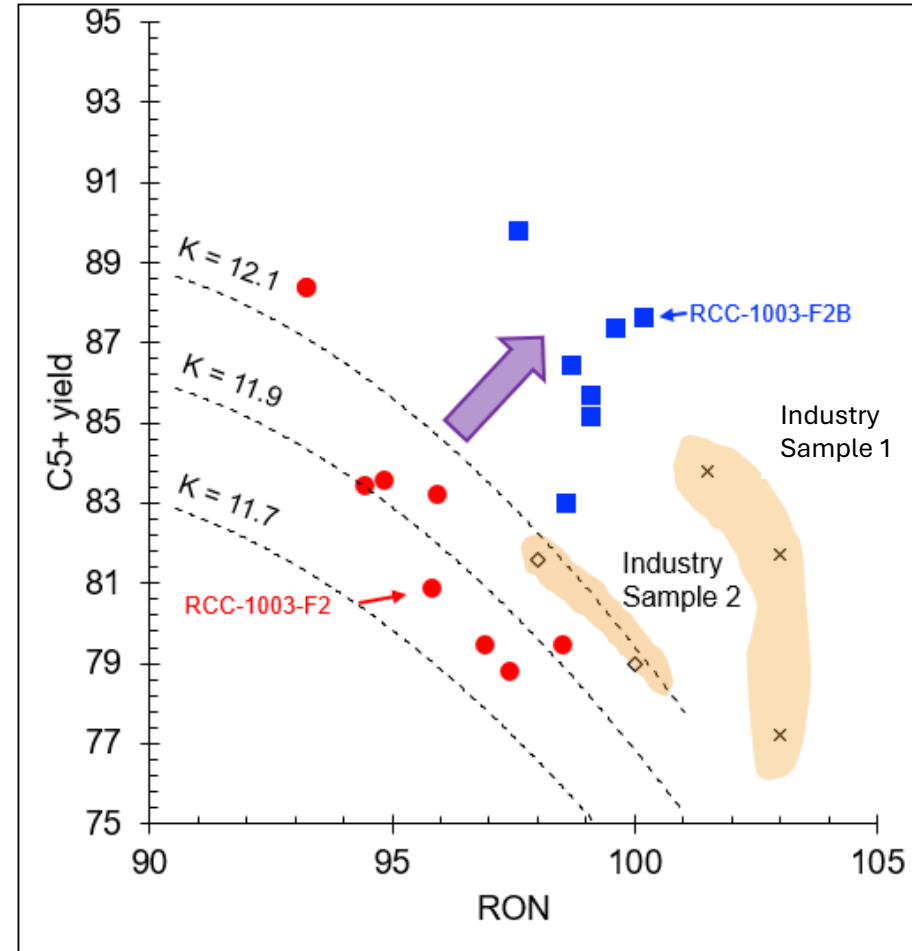
**Generation 1** showed high activity for non-selective cumene cracking.

**Generation 2** had lower cumene cracking and higher aromatic yield.

Optimized generation 2 material is competitive with industry references.



**Dr. Gregory Tate**  
Sr. Chemical  
Engineer, Catalysts





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# CONTACT



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