

REINHOLD ENVIRONMENTAL Ltd.



**2013 NO_x-Combustion Round Table
& Expo Presentations**

February 18 & 19, 2013, in Salt Lake City, UT / Hosted by PacifiCorp

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CORMETECH

Panel II
SCR Effects on Downstream Hg Control
SCR SO₂ & Hg Oxidation

Scot Pritchard

Cormetech, Inc.

2013 Reinhold NOx-Combustion Round Table

Outline



- Catalyst Reaction Mechanisms
- Impacts of SO_3
- SO_3 Mitigation
- Catalyst Improvement Techniques & Results

Simultaneous SCR Reactions: DeNO_x - Hg Oxidation and Reduction & SO₂ oxidation



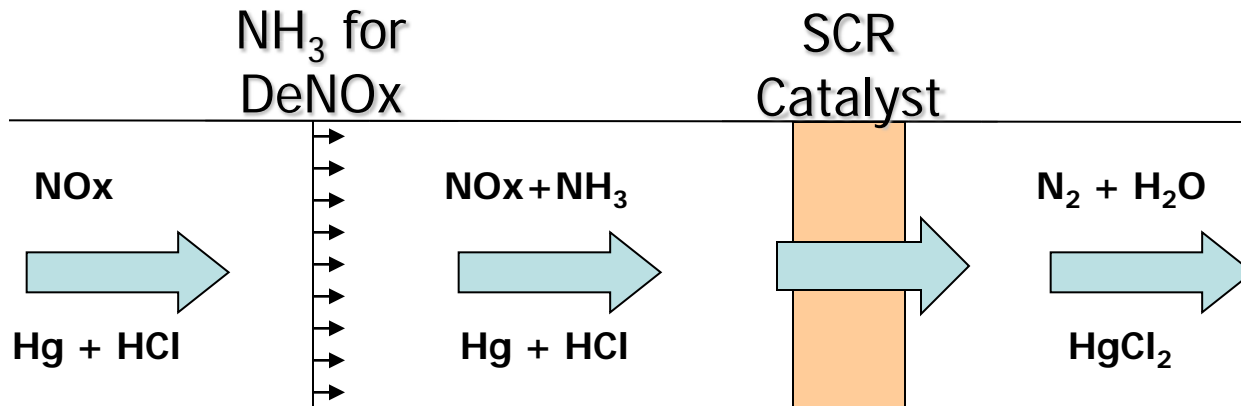
Desired Reactions:



(NO_x Reduction)



(Hg Oxidation)



Undesired Reactions:



Impacts of SO₃

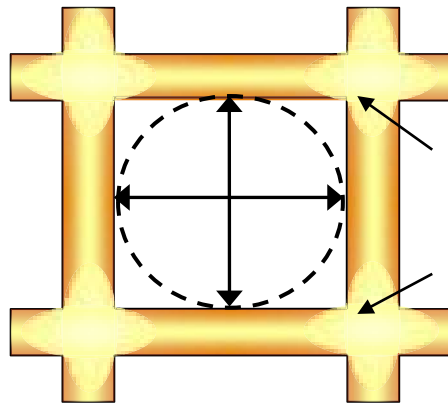


- APH corrosion
- Opacity
- Impact on PAC effectiveness
- Balance with ash properties (resistivity) if ESP is utilized

- Assure SO₂ to SO₃ conversion comparison basis
 - With or without NH₃ (NH₃ suppresses SO₂ oxidation)
- Explore upstream and/or downstream of SCR sorbent injection
 - Potential impact of sorbent on catalyst deactivation
- Explore balance of halogen addition on catalyst Hg ox. effectiveness to balance SO₂ conversion
(used in conjunction with catalyst improvements)

Focus on reduction of SO₂ conversion while maintaining or improving Hg oxidation properties

- Catalyst Properties & Reaction Mechanisms



*Fast DeNO_x and Hg ox reactions limited by mass transport to wall (esp. corners).
Slow SO₂ oxidation reaction is not.*

Patented Gradient Technology allows optimized utilization of active components

- Catalyst Formulations

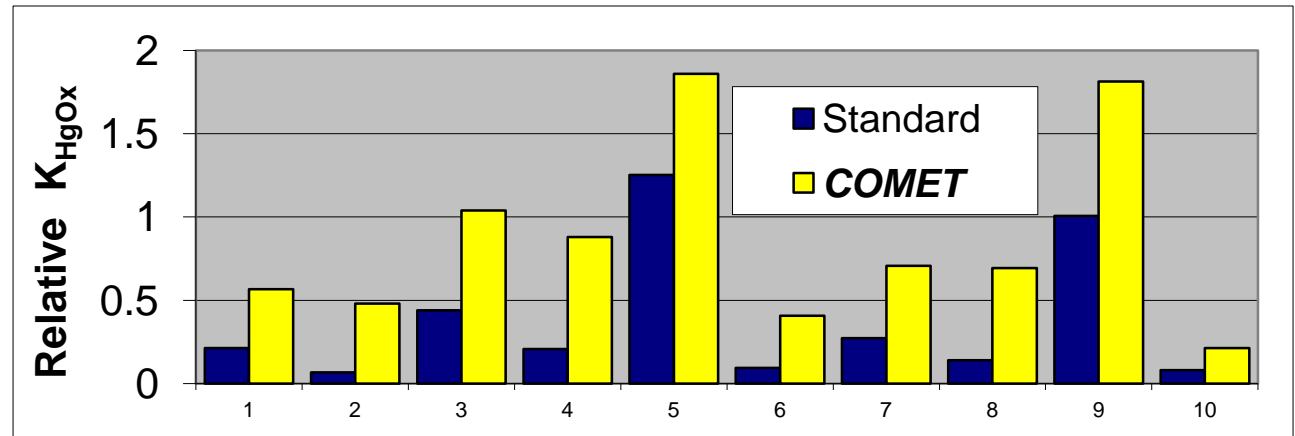
- Enhanced formulations which allow greater utilization and/or enhanced capability to apply higher levels of active components through suppression of negative reactions

Catalyst Improvements



PRB Unit - Case Study: COMET™ –vs-Traditional

Constants	
Temp C	403
NOx ppm	107
O2 %	3.5
H2O %	14
SO2 ppm	345
HCl ppm	8



NH3	ppm	0	0	0	0	0	21	21	21	21	86
CO	ppm	0	100	0	100	0	0	0	100	0	0
HBr	ppm	0	0	0.1	0.1	1	0	0.1	0.1	1	0

**From 50% to 400% higher Hg ox Activity
With 10% higher DeNOx Activity
While maintaining SO₂ conversion**

Levers can be custom balanced to reduce SO₂ conversion with same DeNox activity, etc.