Poster P-06

Development of Optimal Catalyst Designs and Operating Strategies for Coupled LNT/SCR

Mike Harold, Vemuri Balakotaiah, and Dan Luss
University of Houston

Mark Crocker
University of Kentucky, Center for Applied Energy Research

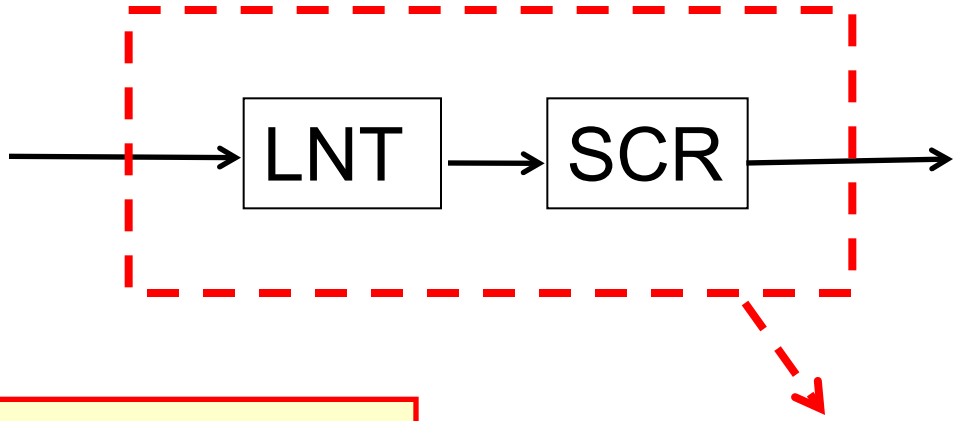
Jae-Soon Choi
Oak Ridge National Laboratory

CZ Wan
BASF Catalysts

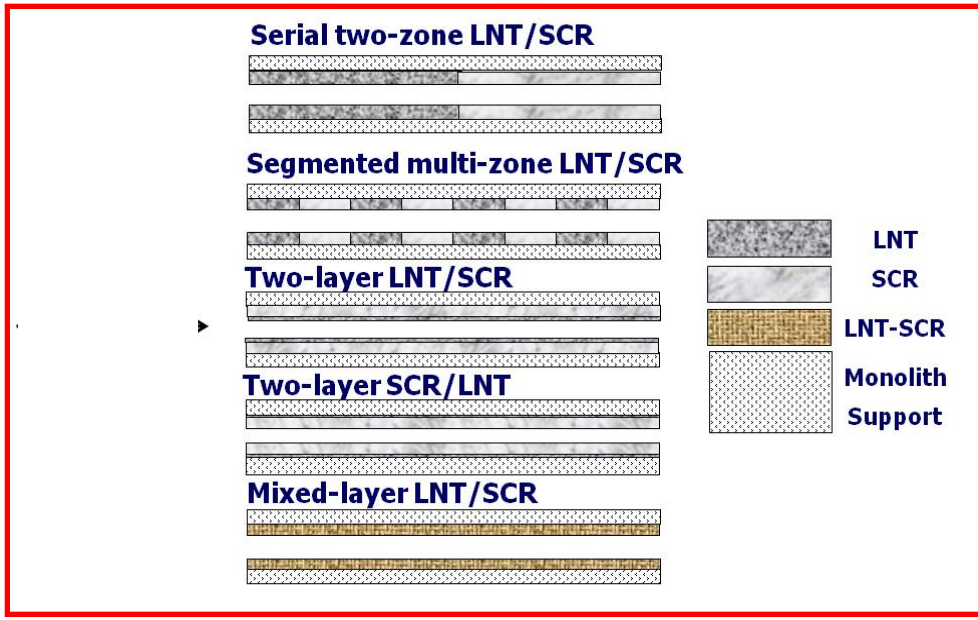
Bob McCabe and Mark Dearth
Ford Research and Development

October 4, 2011,
DEER 2011
Detroit, Michigan

LNT/SCR Technology



Understanding & predicting interactions between storage, transport & reaction is the key to rational design of catalysts & reactors for lean NOx reduction technology



(adapted from Gandhi et al., US Patent, 2007)

Overall Goal & Impact of Project

Goal: Identify the NO*x* reduction mechanisms operative in LNT (Lean NOx Traps) and *in situ* SCR (Selective Catalytic Reduction) catalysts, and to use this knowledge to design optimized LNT-SCR systems in terms of catalyst architecture and operating strategies.

Impact: Progress towards goal will accelerate the deployment of a non-urea NOx reduction technology for diesel vehicles.

Representative Findings

- Development of dual layer Cu/Fe SCR catalyst for expanding temperature window
- Demonstration and prediction of LNT catalyst PGM composition to achieve requisite NH_3 generation
- Demonstration of non-NH_3 pathway for Nox reduction in combined LNT/SCR reactor system
- Development of predictive LNT model to determine PGM loading & dispersion
- Demonstration and prediction of best LNT/SCR architectures to achieved prescribed NOx conversion