Measurement and Modeling of Spatial NH_3 Storage Distributions in a Commercial Small Pore Cu Zeolite Urea SCR Catalyst

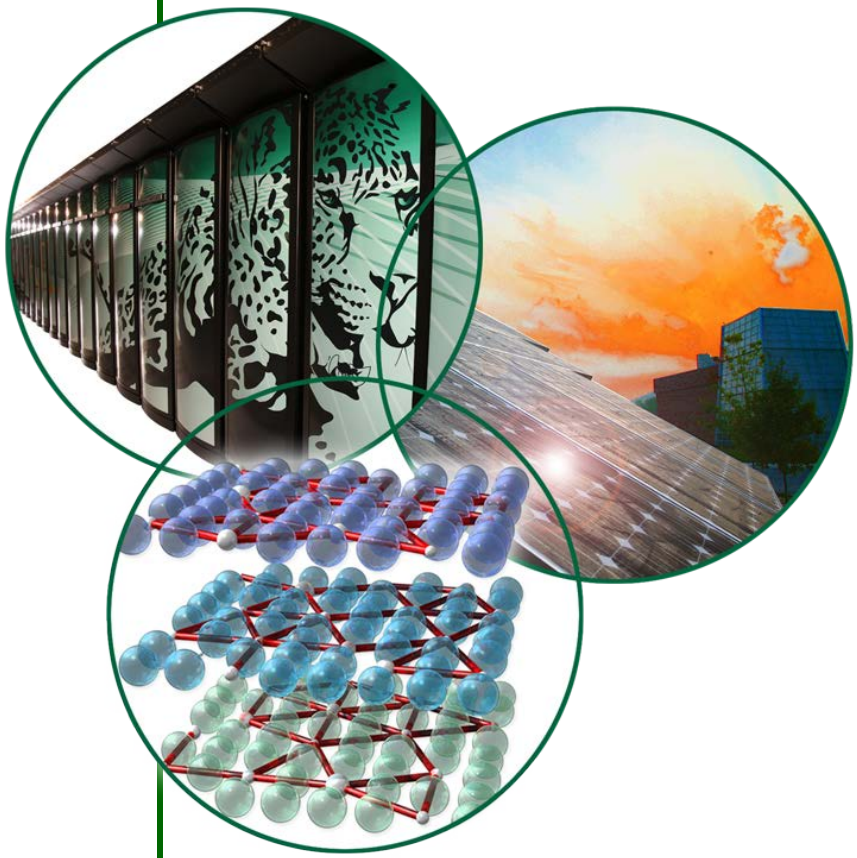
P-21

Josh A. Pihl, James E. Parks

Oak Ridge National Laboratory

Xiaobo Song, Gordon G. Parker, Jeffrey D. Naber, John H. Johnson

Michigan Technological University



Poster presentation to:

18th Directions in Engine-Efficiency and Emissions Research (DEER) Conference

Dearborn, MI
October 17, 2012

U.S. DEPARTMENT OF ENERGY

OAK RIDGE NATIONAL LABORATORY
MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

Objective:

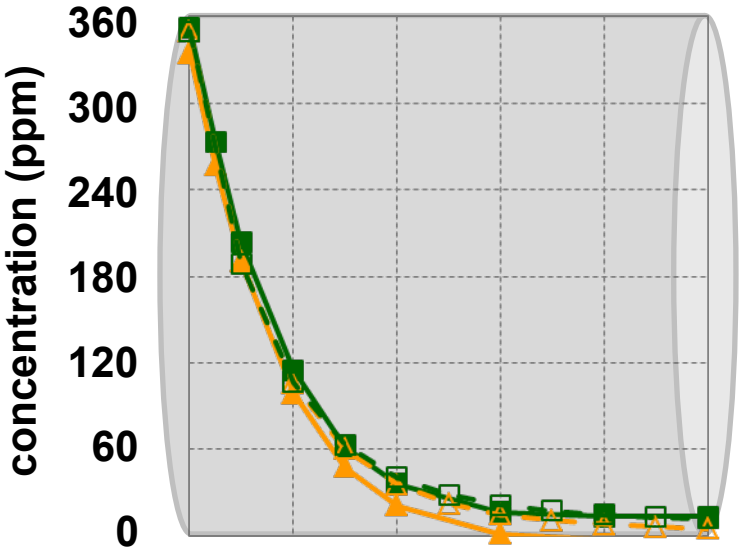
- Utilize spatially resolved experimental measurements to improve the accuracy of SCR catalyst model calibration and validation.

Approach:

- Modify Spaci-IR technique to improve temporal response .
- Deploy Spaci-IR on a flow reactor to measure spatially resolved concentrations and NH_3 storage distributions under relevant SCR conditions.
- Solve for model rate parameters and storage capacities directly from steady state concentration profiles and storage distributions.
- Optimize parameters by comparing model results to transient reactor data.

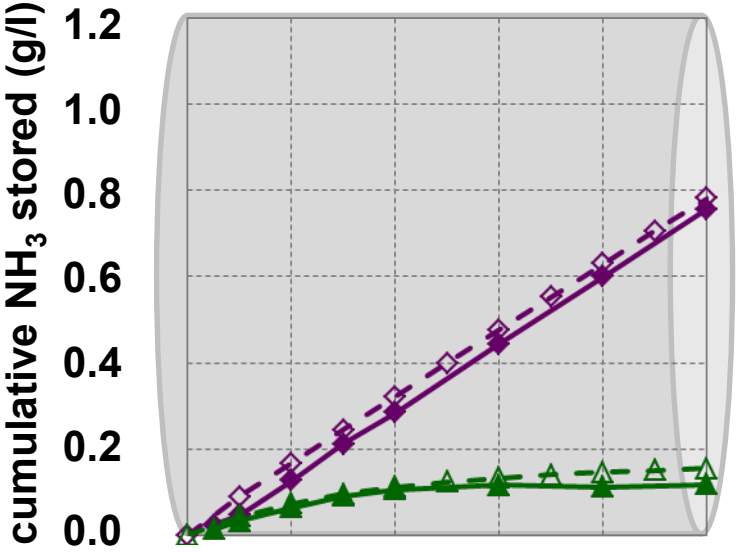
Results:

- Comparison between data and model results for 300 °C NO+NO_2 SCR.



NOx: ■ exp □ sim

NH_3: ▲ exp △ sim



NH_3 capacity: ◆ exp ◇ sim

SCR NH_3 inventory: ▲ exp △ sim