

Track I: Renewable/Alternative Power and Storage

May 20, 2015

11:15 am - 12:25 pm

Room Marco

Selective Non-Catalytic Reduction (SNCR) in a Diesel Engine

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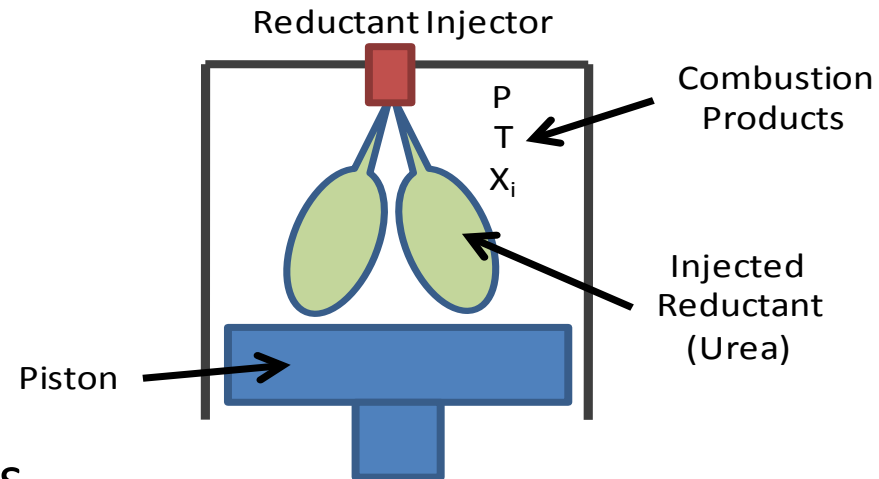
Florida Energy Systems Consortium (FESC) Workshop

Orlando, FL

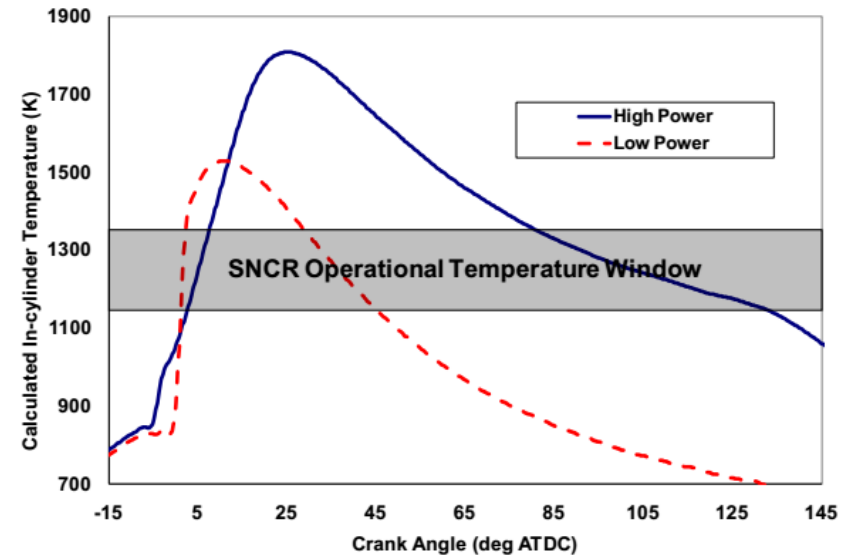
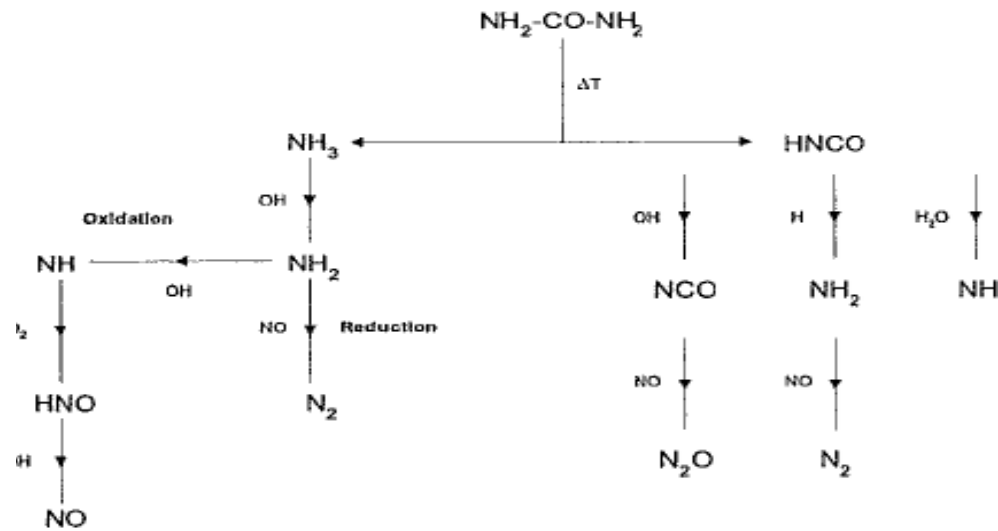
May 20-21, 2015

Introduction

- Currently, industry use of urea is focused on Selective Catalytic Reduction (SCR)
 - Reduces oxides of nitrogen (NO_x) emissions
 - Post-combustion application
 - Requires catalyst
 - Greater than 90% NO_x reduction is possible
- Greater than 80% NO_x reduction is possible with SNCR
- Injecting urea in diesel processes shows promise, but with minimal previous research
 - No catalyst

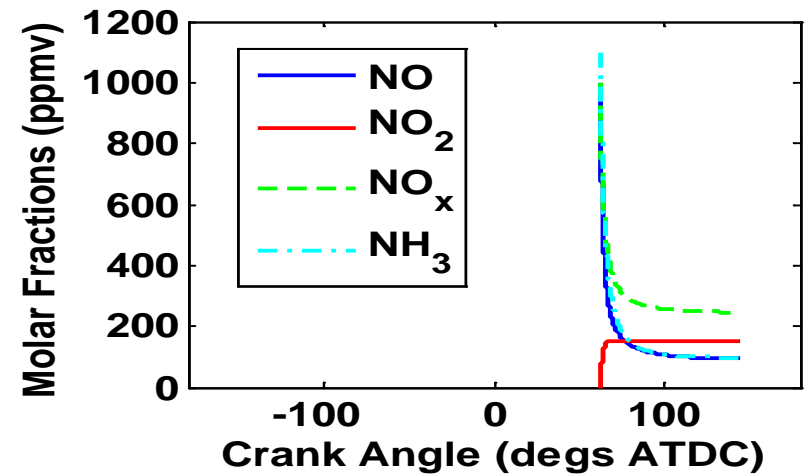
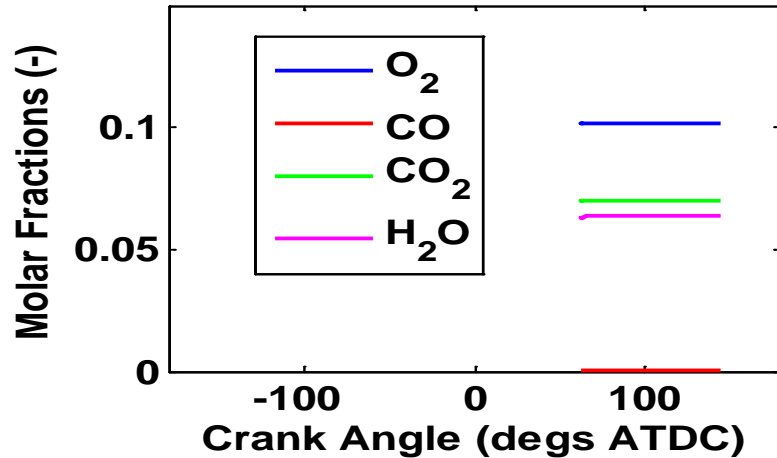
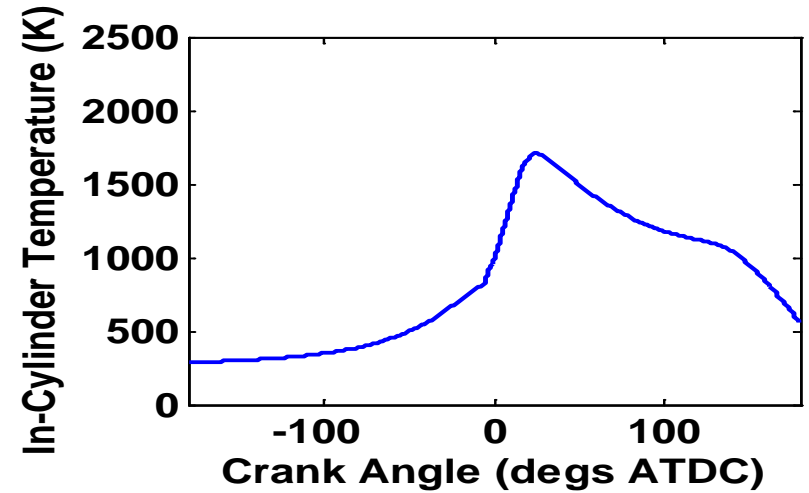
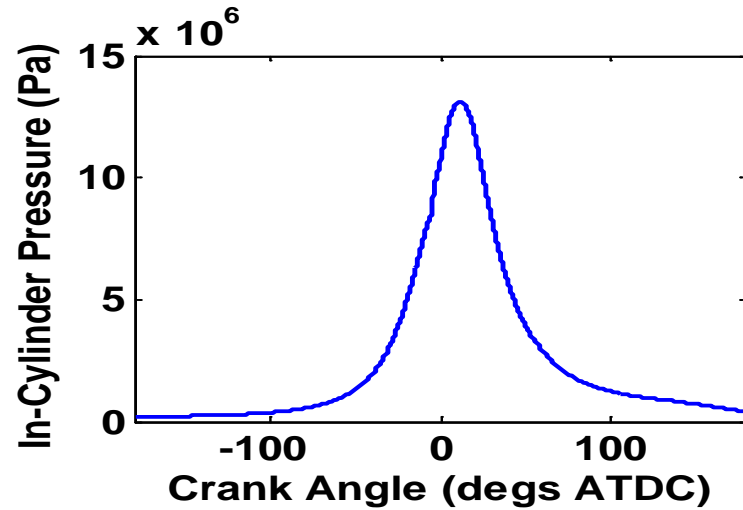


Breakdown of Urea in Combustion



Source: Willand J., Teigeler, M., Wirbeleit, F., Enderle, C., Raab, A., Bockhorn, H., and Schmitt, F., "Selective Non-Catalytic NOx-Reduction in Diesel Engines Using Aqueous Urea," SAE paper 982651, 1998.

Simulation Model for a Conventional Diesel Engine



Experimental Testing

Engine Specifications

Engine Model	Apollo Changfa CF186
Engine Type	Air Cooled, Four Stroke
Ignition Type	Compression Ignition
Combustion Type	Direct Injection
Bore x Stroke (mm)	86 x 72
Compression Ratio	19:01
Total Displacement (cm ³)	418
Rated Speed (rpm)	3600
Rate Power (kW)	9.1

