SULFUR, HYDROCARBON, AND TEMPERATURE EFFECTS ON PLASMA-ENHANCED SCR OF NO_X IN LEAN HEAVY-DUTY EXHAUST: PLASMA-ENHANCED SCR OF NO_x IN SIMULATED HEAVY-DUTY EXHAUST: SULFUR, HYDROCARBON, AND TEMPERATURE EFFECTS

C.L. Aardahl, C.F. Haberger, K.G. Rappe, D.C. Tran, M. Avila, and M.L. Balmer
Pacific Northwest Laboratory

P.W. Park
Caterpillar Inc.

It is well known that a variety of metal oxides are active for the selective catalytic reduction (SCR) of NO_x. Several zeolites and y-alumina in particular have received the bulk of attention in this regard. In a plasma enhanced catalysis CRADA funded through DOE's Office of Heavy Vehicle Technology, Pacific Northwest National Laboratory and Caterpillar, Inc. are co-developing promising catalysts for lean NO_x reduction via plasma activation. Thus far, activity as high as 85% has been observed in bench-scale testing. The results presented will focus on recent findings involving temperature, hydrocarbon, and sulfur effects on selected catalysts developed in the program. In particular, it will be shown that the optimal hydrocarbon ratio required for plasma-assisted SCR varies with temperature and sulfur content in the exhaust.