

PLASMA CATALYSIS DURING TEMPERATURE TRANSIENT TESTING

John Hoard
Ford Motor Company

A combination of catalysts is used together with non-thermal plasma in simulated diesel exhaust, while the gas temperature is varied. The catalysts both store and convert pollutants. As a result, pollutant concentrations during temperature ramps are different from those at steady-state conditions. The data presented consist of plasma followed by BaY, alumina, and Pt catalysts.

When the temperature ramps from high to low, apparent NO_x conversion is quite high. However, when the temperature is ramped from low to high, lower apparent conversions are seen. In a typical test cycle, average NO_x conversion between 100 and 400°C is 60 percent. Peak conversion during the down ramp is over 90 percent, and minimum conversion during the up ramp is 30 percent.

The composition of the effluent gas also varies during the temperature cycle. Intermediates such as methyl nitrate and hydrogen cyanide are not present following the combination of catalysts.