

Abstract Submitted
for the GEC08 Meeting of
The American Physical Society

Plasma-enhanced catalysis at atmospheric pressure, using a dielectric barrier discharge. J.A. REES, D.T. LUNDIE, D.L. SEYMOUR, T.D. WHITMORE, Hiden Analytical — The combination of plasmas and catalysis under moderate temperatures is an emerging area. The techniques are commonly combined in one of two ways. In the first of these the catalyst is introduced into the plasma while in the second, the catalyst is placed down-stream of the discharge. The introduction of a plasma to a catalysis system may produce a change in the distribution or type of reactive species available for reaction or a change of catalyst properties, such as an increase in dispersion or a change in catalyst structure. In the present work, a micro-reactor that allows the study of catalysis using temperature-programmed techniques. The reactor also allows a dielectric barrier discharge (DBD) to be generated over the whole length of the catalyst region or to precede it. The DBD produces a cool plasma at atmospheric pressure and generates surface modifications of the catalyst and is a source of ions and radicals for reaction processes. Test reactions have been studied to show differences in reaction product distributions and activation temperatures when compared with the catalyst alone. Reaction product distributions were measured using a Hiden, capillary-inlet, mass spectrometer. A molecular beam inlet, mass/energy spectrometer was also used to study the constituents of the DBD plasma.

Dave Seymour
Hiden Analytical

Date submitted: 24 Jun 2008

Electronic form version 1.4