gas is not considered feasible. However, onboard reforming of hydrocarbons to generate hydrogen is being implemented as a short-term solution. General Motors/Opel is concentrating its resources on gasoline reforming since the necessary distribution infrastructure is already in place. Modifying the existing infrastructure to distribute methanol as a fuel for reformer vehicles is not thought to be viable. For this reason General Motors has ceased to work on methanol reforming despite its comparative ease.

Shell's technology on catalytic partial oxidation (CPO) of hydrocarbons was described in a keynote lecture by Professor G. J. Kramer (Shell, The Netherlands) during the symposium on alkane activation. Shell Hydrogen, in collaboration with International Fuel Cells, is working on fuel processing technology. Kramer outlined the characteristics of the CPO technology with methane, indicating that the process is carried out in a mass-transfer limited mode of operation. CPO technology would then be developed further so that other feedstock would be included.

To sum up, this was an extremely interesting congress with broad coverage and the participation of leading industry and academic figures describing their technology and contributing ideas. At the time of writing the conference abstracts are still available at the European Federation of Catalysis Societies (EFCATS) website (www.efcats.org).

The venue of the 6th EuropaCat conference will be in Garmisch-Partenkirchen in the South German Alps, organised under the auspices of EFCATS. The conference is scheduled to take place from 14th to 18th September, 2003, and will be a joint event run by the Catalysis Societies of Austria, Germany and Switzerland, see website www.europacat.org.

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Aerobic Oxidation of Alcohols with Palladium-Hydrotalcite

The oxidation of primary and secondary alcohols to the corresponding aldehydes and ketones, respectively, plays an important part in organic synthesis. Traditionally, such transformations have been performed with stoichiometric quantities of oxidants, such as chromium salts, oxalyl chloride, and so on. These work well in small-scale reactions, however on an industrial scale, there is a waste of heavy metals and unwanted coproducts, so the search for effective cleaner catalytic systems which use inexpensive primary oxidants such as molecular oxygen, hydrogen peroxide and/or air (a 'green method') for oxidising alcohols to aldehydes and ketones, remains an important challenge. Several metal catalysts, including Pt, Pd, Ru, Co, Cu, V, Os, Ce and Ni, have all been reported for this system, with Pd being used to advantage with pressurised air. A system using homogeneous palladium acetate has also been reported for the aerobic oxidation of alcohols using pure oxygen.

The scientists who developed the latter system, working at the Department of Energy and Hydrocarbon Chemistry, Graduate School of Engineering, Kyoto University, Japan, have now prepared and successfully used a palladium(II) acetate-pyridine hydrotalcite catalyst to oxidise alcohols to aldehydes and ketones using air as sole oxidant at 65°C (N. Kakiuchi, Y. Maeda, T. Nishimura and S. Uemura, *J. Org. Chem.*, 2001, 66, (20), 6620–6625).

Palladium(II) acetate-pyridine was readily supported on hydrotalcite, $Mg_6Al_2(OH)_{16}(CO_3)\cdot 4H_2O$, a clay mineral, to give a heterogeneous palladium catalyst. With this catalyst alcohols could be oxidised at a lower temperature using air at atmospheric pressure instead of pure oxygen. A variety of primary and secondary alcohols, such as benzyl alcohol and dodecan-1-ol, in toluene were oxidised to the corresponding aldehydes and ketones in high yield. Allylic alcohols, such as geraniol and nerol, were effectively oxidised without any alkenic isomerisation. The catalyst can be easily recovered and reused several times and leaching of the Pd(II) species could be avoided.