Catalysis

Stick to *Teflon* for catalyst recovery

By Marina Murphy

Teflon may be the answer to recovering expensive metal catalysts. German researchers have demonstrated a simple recovery method using *Teflon* tape and said that the same principle could be used to produce industrial-sized reaction vessels with built-in catalysts.

When catalysts and reactants are dissolved in the same solvent, recovery can be difficult. A popular method involves attaching fluorous ponytails, long chains with many fluorine atoms, to the catalyst, and then removing the catalyst using highly fluorinated solvents. But these solvents can be expensive. Researchers at the University of Erlander decided to try a fluorine-contained solid. They found that *Teflon* tape could be used to recover a rhodium metal complex catalyst.

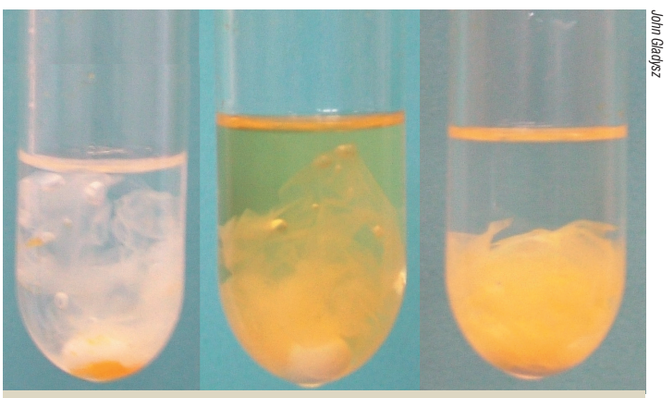
This complex is insoluble in organic solvents at room temperature. The reaction is run at a higher temperature and when allowed to cool, the catalyst deposited on the tape.

'We were really delighted at how well it worked, and want to develop a new range of products for chemists,' said lead researcher John Gladysz. He suggested that catalysts could be sold on rolls of *Teflon* tape. 'A coating might be applied at 1mg/cm of length,' he said. 'All you would need is a pair of scissors. Cutting would be much more accurate than any analytical balance.'

Gladysz noted that catalyst deposition did not occur on stir bars, which are *Teflon* coated. He speculated that the edges of the tape may be facilitating deposition, much like the defects in aluminium facilitate pitting corrosion.

'Absorption is probably kinetically favoured at the edges, because there are more atoms exposed. The ponytails grab onto the corner much more efficiently than they can a flat surface. Once the corners have been colonised, the ponytails around the edges of the flat surface help attract new settlers into the middle.'

Gladysz's group have patented a technique to build the system into industrial sized reaction vessels. He said that any part of the vessel can be made of *Teflon*, and when the system cools the catalyst will precipitate on it. It would be possible to immobilise kilogrammes of catalyst in 500m^3 vessels for hydrogenation, hydrosilation and hydroformylation reactions. The *Teflon* coatings/fittings may have defects built in to provide an anchor for ponytails to become attached (*Angewandte Chemie International Edition*, doi:10.1002/anie.200500237).



John Gladysz

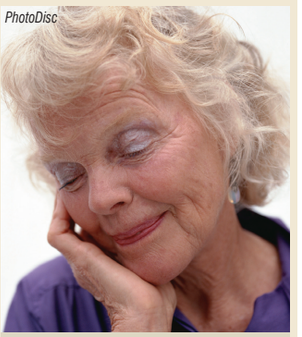
Recycling of a thermomorphic rhodium hydrosylation catalyst using *Teflon* tape

Health

Orgasm addict

By Marina Murphy

Twenty years after the Buzzcocks sang 'Orgasm addict', researchers say that a drug that could help one attain orgasm is possible, at least if you are a woman. But the catch is, it will take a few more years to develop it.



PhotoDisc

Orgasm cure: too late for some?

Scientists said the biggest single factor in a woman's ability to orgasm is her genes. 'There are likely to be hundreds of genes involved,' said researcher Kate Dunn of Keele University, UK. 'We do not yet know the mechanisms, but when we do, treatment might take the form of a psychological therapy or a drug. But it will be at least 10 years before any suitable drugs can be developed,' she said.

Dunn and her colleagues interviewed 4000 identical and non-identical twins aged between 19 and 83 and compared genes and upbringing in influencing orgasm (*Biology Letters*, doi:10.1098/rsbl.2005.0308). The results showed that genes accounted for 34% of the difference between those who could and those who could not.

Microbiology

Dirt-busting bugs could power mobile phones

By Emma Dorey

Small electronic devices, such as battery chargers, mobile phones and remote signalling devices, might be powered by bacteria one day.

Microbiologists have found that some pollution-eating bacteria can generate electricity — a finding that could lead to the development of microbial fuel cells.

The bacteria, a member of the genus *Desulfitobacterium*, are commonly found in freshwater ponds and can detoxify environmental pollutants such as polychlorinated biphenyls (PCBs) and some chemical solvents.

These Gram positive, spore-forming bacteria can consume a wide range of food. 'As long as the bacteria are fed fuel they can produce electricity 24 hours/day,' said researcher Charles Milliken of the Medical University of South California, Charleston. 'The technology could be used to assist in the reclamation of wastewaters, thereby resulting in the removal of waste and generation of electricity.'

The researchers said that optimising the technology, to develop microbial fuel cells, will depend on discovering which bacteria are best at producing electricity and at which combinations, fuels, electrode materials and environmental conditions.

The research was presented at the *105th general meeting of the American Society for Microbiology* in Atlanta, Georgia, on 5–9 June 2005.