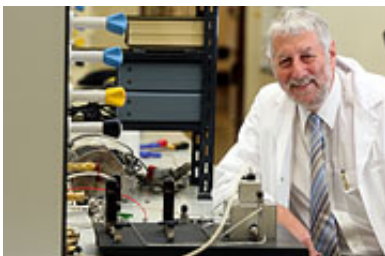


Improving catalysis

June 14 2011



Professor Graham Hutchings

(PhysOrg.com) -- Cardiff University research may help to improve the way that metal nanoparticles are used in catalysis – the process of making chemical reactions go faster.

Metal nanoparticles are fundamental to developments in areas such as photonics, sensing, imaging, medicine and catalysis.

Methods for producing these nanoparticles require the addition of [ligands](#), a protective agent, to stabilize the nanoparticles and stop them coalescing when they bump into each other.

Once the nanoparticles have been stabilized, the ligands are no longer required and their continued presence can actually stop the nanoparticles from being used for surface reactions such as catalysis.

A team from the School of Chemistry has developed a new method for

removing these ligands, thereby improving catalytic activity in a range of reactions.

Professor Graham Hutchings who led the study said: "The ligands effectively block the surface of the nanoparticles preventing access to either light in photosensing applications, or chemicals for catalysis applications. However, removing the ligands once the nanoparticles have been stabilized has always been problematic. Heat treatments have previously been used but these actually damage the surface of the metals."

"What we have found is that a water treatment can actually be used to remove the protecting agents effectively, making the nanoparticles much more active for [catalysis](#)."

"Maximizing the catalytic abilities of these nanoparticles could increase the effectiveness of catalytic reactions in manufacturing and industry."

"Our initial studies have produced some positive results and we're anticipating that this approach should lead to improved application in fields as diverse as environmental protection and energy production."

The study was carried out by Professor Hutchings' team at Cardiff, in collaboration with colleagues at Lehigh University in Pennsylvania. The paper "Facile removal of stabilizer-ligands from supported gold [nanoparticles](#)" was published by *Nature Chemistry* and is available [online](#)

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Provided by Cardiff University

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