

paper. It turns out that the ethanol yield is up a modest 50%, whereas the selectivity falls significantly, and waste carbon dioxide exceeds ethanol by mass.

'There are two different catalysts, four different substrates, several different products, different temperatures and times of evolution, and assorted measures of "goodness", which are cherry-picked to mix and match,' says Kittrell. 'The authors have, in effect, compiled a composite fantasy catalyst highlighting the best benefits from three catalyst/support systems while ignoring and/or suppressing detrimental information from each, and used the supplement as a repository for adverse data ignored in the paper.'

## Controlling iron oxide colour with magnetic fields

University of California, Riverside chemists have found a way of controlling the colour of iron oxide nanoparticles suspended in water through the application of an external magnetic field. Their discovery could be used to make e-paper and colour-changing inks, and help improve the quality and size of electronic displays.

Colloidal photonic crystals such as the particle suspensions used in this work can be fabricated at low cost and on a large scale, and they have attracted interest for

their potential in a number of optoelectronic applications.

In their experiments, Jianping Ge, Yongxing Hu and [Yadong Yin](#) found that by changing the strength of the applied field they were able to change the colour of the solution. Changing the field strength alters the arrangement and spacing of the superparamagnetic nanoparticles, and spacing dictates the wavelength of light that the crystals reflect.

'In order to use the particles for display systems, they need to be patterned into millions of microdroplets on a substrate so that each of them can display different colours in response to the magnetic signals,' says Yin. 'In other words, they need to be patterned as externally addressable pixels.'

Yin adds that for optical micro-electromechanical systems and telecommunications, the iron oxide particles could be

sealed in microfluidic channels and integrated into microchips. Sensors would be based on the optical response of colloidal crystals to chemical changes in their local environment.

'These highly tuneable photonic crystals have a number of significant advantages over conventional tuneable dielectric photonic crystals, says University of Florida chemist [Peng Jiang](#). 'These include faster optical response, wider tuneable range, and an invasive actuating mechanism. This simple bottom-up technology is highly promising for a wide spectrum of applications ranging from full-colour electronic papers and flat-panel displays to micro-optical devices and sensors.'

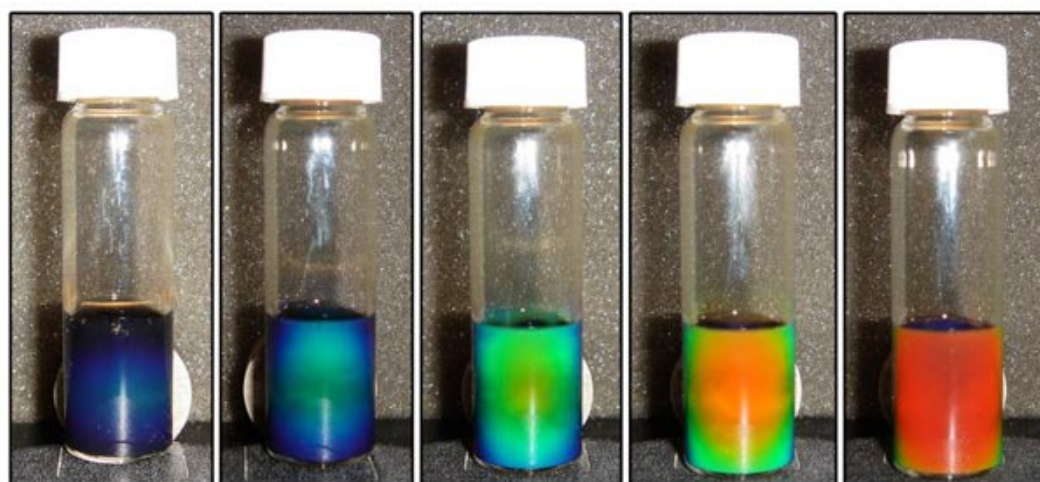
The research is reported online in [Angewandte Chemie's](#) online edition, and will be published as a special feature in a forthcoming print issue of the journal.

## Environmentalists call for stringent Euro regulations on nanotechnology

[BUND](#), the German branch of Friends of the Earth, recently published a [report](#) on the potential health and environmental risks associated with nanotechnology. The document is part of a campaign to gather international support for increased regulatory oversight at European level.

As well as briefly discussing possible models for sustainable nanotechnology, the report makes 10 key recommendations. These include the 'strict application of the precautionary principle', a total opposition to self-replication, public transparency, the classification of nanochemicals as new substances subject to legislative control, and the setting up of a

A solution of iron oxide nanoparticles in water changing colour in response to an external magnetic field, with increasing field strength from left to right



Source: Yin Laboratory, University of California, Riverside