



New catalyst to de-NOx diesel fuel

A catalyst that can economically reduce NOx emissions from diesel engines by 95-100 per cent has been developed by the US Department of Energy.

The Diesel DeNOx Catalyst can be easily retrofitted to existing vehicles, where it will last for 640,000km. A coating of the catalyst is applied to a ceramic brick, similar to a catalytic converter, which is installed in a vehicle's emissions system. It uses the fuel itself as the reductant, eliminating the need to store compounds like ammonia or urea onboard. The technology has been licensed to Integrated Fuel Technologies (IFT), a start up that will target original equipment manufacturers including Cummins, Siemens and John Deere. It is now entering a two-year "real world" testing phase.

More: <http://tinyurl.com/4ln378>

Path to geopolymers glory :: Australia's first geopolymer concrete path has been laid at Curtin University of Technology in WA. Its developers claim a number of benefits over traditional Portland cement-based concretes, including 80 per cent less greenhouse emissions during production.

Geopolymer concretes are produced by reacting aluminate and silicate bearing materials with a caustic activator. Often, waste materials such as flyash from power generation or slag/waste materials from iron and metal production can be used.

"With cement and concrete estimated to contribute around 5-8 per cent of the world's manmade greenhouse emissions, a technology which can produce a superior product with a fraction of the emissions will be an important contributor," says Stevan Green, CEO for the CRC for Sustainable Resource Processing.

More: www.csrp.com.au

Fuel cells with super powers :: Ceramic Fuel Cells (CFU) claims recent advances have increased the lifespan of its fuel cells and boosted power output by 50 per cent for its micro-combined heat and power (mCHP) products.

Cell power density has increased from 350mW/cm² to 500-650mW/cm², allowing CFU to double the power output of its commercial stack design to 2kW and significantly reduce the cost per kW.

Fuel cell stack lifetime has also improved, with cell degradation reduced by 35 per cent in the past four months to less than one per cent per 1,000 hours.

The results have been achieved through advances made in cells, glass technology, interconnect metals, protective coatings on metals and contact technology.

More: <http://tinyurl.com/3o27n7>

Mats put pollution in its place :: The University of New Hampshire's Contaminated Sediments Centre is testing innovative ways to treat polluted waterway sediments. Rather than dredging up the problem or burying it under sand, they have created a patch — black geotextile mats designed to cap and stabilise pollution in place.

The 182cm² mats are 2.5cm thick and consist of a mixture of reactive materials sandwiched between two layers of geotextile fabric, creating a sort of quilt that traps pollutants but allows water to flow through.

The reactive 'filling' between the layers contains substances that bind and stabilise a wide range of pollutants, which includes heavy metals and hydrocarbons.

More: <http://tinyurl.com/65nrzj>

Nanotech on the boil :: Researchers at America's Rensselaer Polytechnic Institute claim that adding an invisible layer of copper nanorods to the bottom of a metal vessel can reduce the energy required to boil water by an order of magnitude.

"Like so many other nanotechnology and nanomaterials breakthroughs, our discovery was completely unexpected," admits Associate Professor Nikhil Koratkar.

Boiling requires interface between water and air. This new technique creates up to a 30-fold increase in bubble formation as nanoscale pockets of air trapped within the forest of nanorods 'feed' nanobubbles into the water.

More: <http://tinyurl.com/5szyug>

Mercury mop up :: Compact fluorescent lights (CFL) are gaining prominence due to their energy saving properties, although their use increases the risk of mercury contamination.

Now, researchers at Brown University in the US have invented mercury-absorbent materials based on nanoselenium.

Their prototype product is a mercury-capturing lining attached to the inside of store-bought CFL packaging. It could be ripped out and used anywhere a bulb has been broken to absorb the mercury vapour from the spill.

They also have created a specially designed lining for plastic bags that soaks up mercury from broken CFL shards, which they say allows old bulbs to be safely disposed.

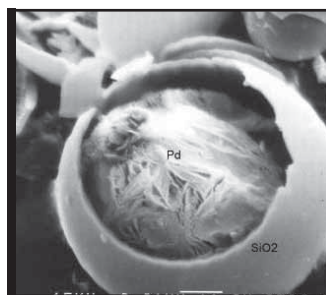
More: <http://tinyurl.com/5458ok>

Microballoons get a rise :: Porous Wall-Hollow Glass Microspheres is a unique material that has been created at the Savannah River National Laboratory in the US. The material consists of porous glass 'microballoons' with diameters of just 2-100 micron.

Researchers have been able to fill these microballoons with gas absorbents and other materials. Hydrogen or other reactive gases can then enter the microspheres through pores and the structure creates a relatively safe, contained, solid-state storage system for gases, including CO₂.

Once emptied of the gas, the microballoons can be reused.

More: <http://tinyurl.com/6lwap4>



Microballoons can store gases.