



New Application Developments in PGMs – December 2009

Pacifying explosive hydrogen leaks

theVARSITY.ca, 03 December 2009

Hydrogen nano-sensor offers new method for Hindenburg prevention

<http://thevarsity.ca/articles/23661>

Customized nanoparticles: Platinum

Chemical & Engineering News, 07 December 2009, Volume 87, Number 49, p. 10

Catalysis: Method endows platinum with benefits of solid- and solution-phase catalysts

<http://pubs.acs.org/cen/news/87/i49/8749notw7.html>

Chemists Cole A. Witham, F. Dean Toste, Gabor A. Somorjai, and coworkers at the University of California, Berkeley, have tailored the properties of platinum nanoparticles to drive reactions never before catalyzed by solids. Specifically, the team made the particles electrophilic by treating them with the hypervalent iodine species PhICl_2 . Then they encapsulated them in a polyamidoamine dendrimer or in polyvinylpyrrolidone and dispersed the composites on porous silica to render them thermally stable and to prevent them from aggregating.

Catalyst change improves the selectivity of a hydroformylation process: Rhodium

Patent Watch, 07 December 2009

http://portal.acs.org/portal/PublicWebSite/patent/archive/CNBP_023576

D. F. White, W. P. Shum, and D. J. Cole-Hamilton (for Lyondell Chemical Technology) disclose the development of a new ligand system for the rhodium-based hydroformylation catalyst that significantly improves selectivity to the linear 4-hydroxybutyraldehyde. The basis of the new ligand system is 4,5-bis(di-n-alkylphosphino)xanthenes. A preferred ligand is 9,9-dimethyl-4,5-bis(diethylphosphino)xanthene.

Two techniques are better than one

Highlights in Chemical Biology, 10 December 2009

http://www.rsc.org/Publishing/Journals/cb/Volume/2010/01/two_techniques.asp

Fluorescence imaging and Raman mapping are two common techniques used to study live cells and understand the processes occurring in diseased cells such as tumours. But Raman microscopy can suffer from low sensitivity and background fluorescence interference limiting its usefulness. Tia Keyes and colleagues at Dublin City University have shown that using ruthenium complexes to label cells allows both techniques to be carried out independently without changing the conditions. This allows consecutive or simultaneous imaging by both techniques.

Two techniques are better than one: Ruthenium

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Unearthing chemistry's rare gems: Rhodium

Research Highlights - RIKEN RESEARCH, 11 December 2009

<http://www.rikenresearch.riken.jp/eng/research/6108>

Image, http://www.rikenresearch.riken.jp/images/figures/hi_4136.jpg

Zhaomin Hou from the RIKEN Advanced Science Institute in Wako and colleagues have used an yttrium-based rare-earth cluster to generate a new series of complexes that hold vital structural clues towards improving catalytic reactions.

They found that a rare-earth yttrium hydride (YH) cluster reacted with a rhodiumcarbon monoxide (RhCO) complex to give a new organicmultimetallic species, accompanied by cleavage of the C≡O triple bonds.

A search for stability for platinum catalysts

PNNL: Research Highlights | Chemical & Materials Sciences Division, December 2009

<http://www.pnl.gov/science/highlights/highlight.asp?id=708>

A new carbon support that greatly increases the durability of proton-exchange membrane fuel cells has been developed by scientists at Pacific Northwest National Laboratory and Princeton University. This new material significantly improves the stability of the fuel cell platinum catalyst and will potentially lower the cost of these fuel cells.

Nanoparticles go platinum: NCEM instruments provide key images

Berkeley Lab News Center, 21 December 2009

<http://newscenter.lbl.gov/feature-stories/2009/12/21/nanoparticles-ncem-images/>

Berkeley Lab's National Center for Electron Microscopy (NCEM) provided the technology and a Visiting Scientist Fellowship that helped a Missouri State University researcher make a key discovery which should boost efforts to use carbon nanotubes as catalytic supports in direct ethanol fuel cells. Using the advanced characterization capabilities of NCEM's TEAM 0.5 and Tecnai microscopes, materials scientist Lifeng Dong found that single-stranded DNA can be used to disperse bundles of single-walled carbon nanotubes into individual tubes. The single strands of DNA can also serve as guideposts for synthesizing platinum nanoparticles onto these tubes.

Bright prospects for organic-LED lighting: Iridium

SPIE Newsroom: SPIE.org, 28 December 2009

Improved device designs will boost the efficiency of white organic light emitters to exceed that of conventional lighting sources.

<http://spie.org/x38277.xml?highlight=x2408&ArticleID=x38277>

Arsenic and platinum fight together against cancer

Noteworthy Chemistry, 28 December 2009

http://portal.acs.org/portal/PublicWebSite/noteworthy/archive/CNBP_023749

T. V. O'Halloran and coauthors at Northwestern University (Evanston, IL) and the University of Michigan (Ann Arbor) have developed a strategy to make use of both elements by co-encapsulating compounds in a single liposomal vesicle.

Bimetallic nanocatalysts enhance hydrogen selectivity from hydrazine decomposition: Rhodium

Noteworthy Chemistry, 28 December 2009

http://portal.acs.org/portal/PublicWebSite/noteworthy/archive/CNBP_023749

Using bimetallic rhodium–nickel nanocatalysts, S.K. Singh and Q. Xu at the National Institute of Advanced Industrial Science and Technology (Osaka, Japan) demonstrated the utility of hydrous hydrazine as a potential hydrogen storage material.

For more scientific research papers on platinum group metals go to: www.platinummetalsreview.com