

# FROM THE LITERATURE

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A review-article has been published as a contribution from the Università de L'Aquila (A. Arcadi, *Chem. Rev.*, 2008, **108**, 3266) on the synthesis of organic products catalyzed by gold complexes. Some of the reactions considered are: additions to carbon-carbon multiple bonds, such as hydrohalogenation, hydration, hydroxylation, hydrocarboxylation, hydroamination of alkynes, and others. Another review-article on novel syntheses of azetidines and azetidinones, frequently catalyzed by transition metals, has also appeared, as a contribution from the Università di Firenze (A. Brandi *et al.*, *Chem. Rev.*, 2008, **108**, 3988).

An article in *Chem. Commun.*, **2008**, 1621, by M.R. Chierotti and R. Gobetto (Università di Torino) deals with the recent acquisitions by their group in the study of crystalline and amorphous phases in supramolecular systems, with special attention to weak interactions, such as hydrogen bonds, by means of NMR measurements.

Stabilization of ruthenium nanoparticles has been reported to be obtained through the decomposition of Ru(COD)(COT) (COD=1,5-cyclooctadiene; COT=1,3,5-cyclooctatriene) in the presence of 4-(3-phenylpropyl)pyridine under H<sub>2</sub>, as for a paper from three different research laboratories of the French CNRS located in Toulouse (I. Favier *et al.*, *Chem. Commun.*, **2008**, 3296). The average diameter distribution of the particles thus obtained is 1.27±0.33 nm for 696 particles. Along similar lines, the hydrogenation of benzene was reported, as for a paper due to the collaboration of the ICCOM-CNR and ISTM-CNR institutes of Firenze with the Dipartimento CIMA, Università di Milano, and ISTM-CNR of Milano (P. Barbaro *et al.*, *Organometallics*, 2008, **27**, 2809): the catalytic system is constituted by silica-supported palladium nanoparticles interacting with a rhodium(I) system containing 1,3-diphenylphosphinoethane and COD as ligands. The catalyst obtained by this method shows a remarkable stability, can be recycled several times, and, furthermore, can be handled in air.

Palladium nanoparticles are produced by treating bis(acetato)palladium(II) with tetrabutylammonium bromide and tetrabutylammonium acetate at 90 °C in air (V. Calò *et al.*, *J. Organometal. Chem.*, 2007, **692**, 4397). The metal particles were used for the dehydrohalogenation of aryl chlorides, as carried out with di-hydrogen at about 90 °C, thus obtaining substantially quantitative yields of the required product. A review-article has appeared on late transition metal complexes used as catalytic precursors for olefin polymerization and olefin/CO co-polymerization (T.M.J. Anselment *et al.*, *Dalton Trans.*, **2008**, 4537), as a contribution from the Technische Universität München. In this connection, a paper has recently appeared (A. Scarel, *et al.*, *Organometallics*, 2008, **27**, 1486) contributed by the Universities of Trieste, Milano, Amsterdam, and Urbino, reporting steric and electronic effects on the palladium-catalyzed co-polymerization of CO and vinylarenes in the presence of bis(aryl)acenaphthenequinonedi-imines as ligands.

A new monolayered sensor containing a binuclear rhodium complex

immobilized on glass has been shown to be sensitive to CO at ppm levels, while it does respond to several other pure gases and their mixtures, as for a report from the Universities of Catania and Messina, in collaboration with Northwestern University and the Weizmann Institute of Science (A. Gulino *et al.*, *Chem. Commun.*, **2008**, 2900).

A blend of regioregular poly(3-hexylthiophene) and *N,N'*-bis(1-ethylpropyl)-3,4,9,10-perylenebis(carboximide) as donor and acceptor, respectively, was cast on SiO<sub>x</sub> by using a chloroform solution of the two components, as for a collaboration of the ISOF-CNR Institute of Bologna with the Max-Planck Institute for Polymer Research, Mainz, and the ISIS-CNRS Institute of Strasbourg (A. Liscio *et al.*, *J. Am. Chem. Soc.*, 2008, **130**, 780). By Kelvin probe force microscopy (KPFM), the proof was collected of photovoltaic activity in a phase-segregated system of this type.

A paper from the Università di Salerno (C. Daniel *et al.*, *Chem. Mater.*, 2008, **20**, 577) describes some syndiotactic polystyrene aerogels. The experimental data based on N<sub>2</sub>-uptake at 77 K show that the aerogels of  $\delta$ -polystyrene present crystalline nanocavities in addition to amorphous porosity. A second recent contribution from the Universities of Napoli and Salerno (V. Petraccone *et al.*, *Chem. Mater.*, 2008, **20**, 3663) has reported that the  $\epsilon$ -phase of syndiotactic polystyrene, as manufactured by Dow Chemical Company under the trademark of Questa 101, is characterized by a nanoporosity organized in channels.

Self-assembled mesoporous SiO<sub>2</sub>-GeO<sub>2</sub> films, as obtained by evaporation of solutions of the corresponding tetrachlorides in ethanol (S. Costacurta, *et al.*, *Chem. Mater.*, 2008, **20**, 3259), were reported, according to a contribution from the Universities of Sassari, Kyoto and Padova, in collaboration with the European Synchrotron Radiation Facility of Grenoble. Pluronic F127, a bifunctional block copolymer containing primary hydroxyl groups, was used as a templating agent. A collaboration between the Universities of Pisa and Bologna has produced a paper (F. Marchetti *et al.*, *Chem. Commun.*, **2008**, 3651) describing the formation of 1,4-dioxanes and alkyl chloride by reacting polyethers with NbCl<sub>5</sub> at room temperature.

Researchers of the Università di Venezia and the Universidade de Vigo have described the preparation of hydrido complexes of ruthenium(III) containing bidentate phosphato ligands (J. Bravo *et al.*, *J. Organometal. Chem.*, 2007, **692**, 5481). The complexes were studied by the appropriate spectroscopic techniques, including X-ray diffraction methods for four of them.

A paper has appeared (J. Martinez-Lillo *et al.*, *J. Chem. Soc., Dalton Trans.*, **2008**, 40), as a contribution from the Universidad de Valencia and the Università della Calabria, describing the preparation and crystal structure of the Re(IV)/Cu(II) compound of formula ReCl<sub>4</sub>( $\mu$ -C<sub>2</sub>O<sub>4</sub>)Cu(pyim)<sub>2</sub>, where pyim is the ligand 2-(2-pyridyl)imidazole, the oxalato group adopting the bidentate coordination mode. The

rhodium(IV) centres of  $5d^3$  configuration and the  $3d^9$  centres of copper(II) interact leading to antiferromagnetic coupling at low temperature (the Cu...Re distance is 4.544(1) Å).

A contribution from the University of Illinois at Urbana-Champaign and the Università di Milano-Bicocca (J.L. Stanley *et al.*, *Organometallics*, 2008, **27**, 119) has described the preparation and properties of three binuclear derivatives of  $3d^7$  iron(II), namely two of formula  $\text{Fe}_2[(\text{SCHR})_2\text{NH}](\text{CO})_6$ , R=H, Me, and the triphenylphosphine-substituted compound  $\text{Fe}_2[(\text{SCHR})_2\text{NH}](\text{CO})_5(\text{PPh}_3)$ , containing an aza-dithiolato ligand. By X-diffraction studies, it was established that the Fe-Fe separation in these compounds is around 2.51 Å. The  $\text{pK}_a$  values of some of these compounds were determined in acetonitrile solution. A contribution from the Università di Venezia (L. Canovese *et al.*, *Organometallics*, 2008, **27**, 3577) has reported the *cis-trans* isomerization of dimethylmaleate to dimethylfumarate in the presence of palladium(0) complexes containing nitrogen- and phosphorous as donor atoms from 8-(diphenylphosphino)quinoline.

A linear tetrahydrido complex of platinum(II) of formula  $\text{Pt}_3(\mu\text{-H})_2(\text{H})_2(\mu\text{-PR}_2)_2(\text{PHR}_2)_2$ , R= *i*Bu, with terminal and bridging hydrido- and phosphido bridges has been reported (P. Mastroilli, *Dalton Trans.*, 2008, 4555), as a contribution from the Politecnico di Bari. *N,C*-cyclometalated hydrido complexes of platinum(II), containing a rather uncommon set of donor atoms (nitrogen and carbon), have been obtained (G. Minghetti *et al.*, *Organometallics*, 2008, **27**, 3415) at the Università di Sassari. Di-hydrogen absorption by metal-containing materials is still a subject of considerable interest. A Feature Article by A.W.C. van der Berg *et al.* (*Chem. Commun.*, 2008, 668) has described the methods of storage and transport of  $\text{H}_2$ , in the perspective of a transition to a hydrogen-based economy. It is the personal view of the author of the present compilation that these systems are of considerable interest, especially for small-scale installations or for systems based on renewable energy sources. The so-called metallorganic frameworks (MOF) have been extensively investigated as  $\text{H}_2$ -storage materials: one such a system has recently been reported by researchers operating at the Università di Torino, in collaboration with the Norwegian SINTEF Materials and Chemistry group located at Blindern, Norway (J.G. Vitillo *et al.*, *J. Am. Chem. Soc.*, 2008, **130**, 8386): three systems were studied by IR spectroscopy in a cryogenic cell at variable pressure in the range of temperature 300: 20 K. In a related paper (C.P. Baldé, *et al.*, *J. Am. Chem. Soc.*, 2008, **130**, 6761),  $\text{NaAlH}_4$  particles were supported on carbon nanofibers using tetrahydrofuran solutions of the hydride. A contribution from the NIST Center for Neutron Research, Maryland, the University of Maryland and the California Institute of Technology (Y. Liu *et al.*, *Langmuir*, 2008, **24**, 4772) has reported the absorption of  $\text{H}_2$  by MOF-74 containing open sites of Zn(II). A new synthetic strategy has been reported (F.G. Brunetti

*et al.*, *J. Am. Chem. Soc.*, 2008, **130**, 8094), as for a contribution from the Università di Trieste, the Universidad de Castilla-La Mancha and the Università di Padova, for producing multi-functionalized carbon nanotubes (CNT) through a microwave-induced method consisting of the 1,3-dipolar cyclo-addition of azomethine ylides or the addition of diazonium derivatives. Polyketones, as derived from the co-polymerization of CO with styrene or 4-methylstyrene, were hydrogenated by using an iridium(II) derivative of formula  $[\text{Ir}(\text{cod})(\text{NN})]\text{X}$  as catalytic precursor (NN = a bidentate nitrogen donor; cod = 1,5-cyclooctadiene), as reported in a paper originated from two research institutions located in Trieste (B. Milani *et al.*, *Dalton Trans.*, 2008, 4659).

The Dipartimento di Chimica of the Università di Padova and the Padova Section of ITM-CNR have studied the origin of the dendritic effect in multivalent enzyme-like catalysts (G. Zaupa *et al.*, *J. Am. Chem. Soc.*, 2008, **130**, 5699). The metallo-dendrimers reported in this paper catalyze the cleavage of (2-hydroxypropyl-*p*-nitrophenyl-phosphate), a model compound of RNA. New water-soluble nanoparticles containing gadolinium, useful for Magnetic Resonance Imaging have been reported in a paper resulting from the collaboration within some Italian and French institutions (Y. Guari, *et al.*, *Dalton Trans.*, 2008, 3658).

R. Lauceri *et al.* (*J. Am. Chem. Soc.*, 2008, **130**, 10476), as for a contribution from the Universities of Catania and Roma "Tor Vergata", have studied the interaction of porphyrins, with or without copper(II), with phenylalanine. Two optical absorptions at about 400 nm were used for studying the progress of the process.

A contribution from some research institutions located in Napoli and Firenze (L. Vitagliano *et al.*, *J. Am. Chem. Soc.*, 2008, **130**, 10527) deals with the spectroscopic and crystallographic characterization of a tetrameric haemoglobin undergoing structural changes on passing from the CO-containing species to the oxygenated one upon exposure to air. This study also shows that there is no major barrier in the transition from the relaxed to the tense state. The acylation of ferrocene was studied, as a contribution from the Universities of Roma and Padova (S. Berardi *et al.*, *J. Organometal. Chem.*, 2008, **693**, 3015), both by a conventional method and by microwave irradiation, the latter resulting in a quantitative conversion over a short time.

Single-molecule magnets, derived from iron(III) complexes containing propeller-like tripodal ligands derived from 2-hydroxymethyl-propylene-1,3-diol, have been reported (G.G. Condorelli *et al.*, *Chem. Mater.*, 2008, **20**, 2405), as precursors for the preparation of functionalized silicon surfaces, according to a contribution from seven Italian research institutions.

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