

◆ Giacomo Chiari, of the Getty Conservation Institute in Los Angeles has utilized a XRD/XRF approach to analyse the outdoor sculptures and manuscripts of the Getty Museum; this method is expected to be soon utilized in the study of the ruins of Hercoleaneum [*Chemistry World*, March 2010, p. 50-53].

◆ Natural and artificial photosynthetic energy conversion has been discussed in a review article by J. Barber of Imperial College London [*Chem. Soc. Rev.*, 2009, **38**, 185]. Particular attention has been paid to Photosystem II, the water splitting enzyme providing the appropriate reducing equivalents to convert carbon dioxide into organic molecules.

◆ Ferrocenyl-based bimetallic indenyl complexes were reported by researchers of the Università di Padova, in collaboration with the CNR Istituto di Chimica Inorganica e delle Superfici located in the same town [S. Santi *et al.*, *Organometallics*, 2009, **28**, 3319]. The complexes have the general composition  $[\eta^5-(2\text{-ferrocenyl})\text{indenyl}]ML_n$ , and the compound with  $ML_n = Cr(CO)_3$  was studied by X-ray crystallography. Electrochemical oxidation of the compounds allowed the authors to evaluate the metal-metal electronic coupling between the ferrocenyl-containing moiety and several metallic fragments, namely  $\{Ru(\eta^5-C_5Me_5)\}$ ,  $\{Fe(\eta^5-C_5H_5)\}$ ,  $\{Ir(COD)\}$ ,  $\{Mn(CO)_3\}$ , and  $\{Cr(CO)_2NO\}$ . ◆ A contribution from the Università di Torino [J.G. Vitillo *et al.*, *Inorg. Chem.*, 2009, **48**, 5439] deals with grafting the  $Cr(CO)_3$  moiety on doubly *p*-substituted six-membered rings. The effect of the electronic properties of the substituents on the carbonyl stretching vibrations has been reported. ◆ Some earlier papers report the thermal synthesis of  $Cr(\eta^6\text{-arene})(CO)_3$  from the hexacarbonyl and the aromatic compound [E.O. Fischer *et al.*, *Chem. Ber.*, 1957, **90**, 2543; G. Natta *et al.*, *Gazz. Chim. Ital.*, 1958, **40**, 2875; B. Nicholls *et al.*, *Proc. Chem. Soc.*, **1958**, 152]. ◆ As a contribution from the University of Georgia, a paper has appeared [A.M. Ricks *et al.*, *J. Am. Chem. Soc.*, 2009, **131**, 9176] dealing with the problem of seven-coordinate metallic derivatives containing carbonyl groups. Mass-spectrometry of the positively charged metal carbonyl derivatives were obtained by laser vaporization in a supersonic expansion of carbon monoxide. The most abundant carbonyls for vanadium and tantalum are the hexacarbonyl and the heptacarbonyl, respectively.

◆ Research activity carried out at the Politecnico di Milano and at the Università di Parma [M. Galletta *et al.*, *Dalton Trans.*, 2010, **39**, 2546] dealt with the extraction of radioactive materials (actinide/lanthanide separation). Calix[6]arene-based picolinamide derivatives were used as coordinating agents.

◆ A sol-gel route to prepare carbon/TiO<sub>2</sub> composite structures was developed at the General Motors Research and Development Center in USA [S. Donthu *et al.*, *Chem. Comm.*, **2009**, 4203]. The resulting

substrates were doped by using  $[PtCl_6]^{2-}$  as the platinum source and ethylene glycol as the reducing agent. ◆ The structural control of mesoporous platinum deposition process [Y. Kuroda *et al.*, *Chem. Commun.*, 2010, **46**, 1827] has been carried through the use of both a silica nanoparticle assembly and Pluronic 123. ◆ A contribution from Cornell University [M.C. Orilall *et al.*, *J. Am. Chem. Soc.*, 2009, **131**, 9389] reports the incorporation of platinum nanoparticles in a composite constituted by niobium oxide and carbon. Loading of Carbon Vulcan with several metals including platinum has been reported. ◆ As mentioned in a preceding report of this series, work carried out at the Università di Pisa in collaboration with Alta SpA, Pisa [L. Romeo *et al.*, 43<sup>rd</sup> Joint Propulsion Conference, July 2007, Cincinnati; 5<sup>th</sup> Int. Spacecraft Propulsion Conference, May 5-8 2008, Heraclion, Crete, Greece; 44<sup>th</sup> Joint Propulsion Conference and Exhibit, Hartford, Conn., USA, July 2008] has shown the possibility of preparing catalytic beds based on transition metals, including platinum, by using silica or  $\gamma\text{-Al}_2\text{O}_3$  as the support. ◆ A mesoporous organosilica, functionalized with carboxylic groups, has been prepared [S. Fiorilli *et al.*, *Chem. Commun.*, **2009**, 4402], as a contribution from the Università di Torino. ◆ Silver nanoclusters have been deposited on Engelhard titanosilicalite ETS-10, according to researchers of the Università di Torino, in collaboration with other Institutions located in France [G. Agostini *et al.*, *Chem. Mater.*, 2009, **21**, 1343]: by thermal- and chemical treatments, and through irradiation with UV light, the isolated silver ions aggregate into nanoclusters of increasing nuclearity. ◆ A silica-zirconia matrix has been treated with some *N,N*-dialkylcarbamato derivatives of copper(II), as a contribution from the Universities of Stuttgart, Giessen and Wien, in collaboration with the Universities of Pisa, Milano-Bicocca and Padova [D. Belli Dell'Amico *et al.*, *Chem. Eur. J.*, 2009, **15**, 4931]. The grafting of the copper(II) precursor was monitored by FTIR, XPS, EPR, XAS, XRD, TEM, and dinitrogen absorption.

◆ A contribution from the Università di Perugia in collaboration with the Université de Montpellier [G. Ciancaleoni *et al.*, *Organometallics*, 2009, **28**, 960] has reported on the self-aggregation of ruthenium(II) complexes of general formula  $RuX(N,N)(p\text{-cymene})$ , *N,N* referring to the ligated atoms of an aminoamidato ligand and  $X=Cl$ , or  $H$ . The dimerization process occurs through the  $NH/SO_2$  interaction of the two partners.

◆ A  $\mu_4$ -oxo-centered structure of zinc carrying 1,4-benzenedicarboxylato functions further connected to tricarbonylchromium(0) functionalities has been reported [S.S. Kaye *et al.*, *J. Am. Chem. Soc.*, 2008, **130**, 806], as a contribution from the University of California. The resulting products are expected to perform gas absorption properties. ◆  $\mu_4$ -Oxo-centered structures for carboxylato derivatives of zinc(II) are well-established in the literature and *N,N*-dialkyl-

carbamato complexes of this element have been studied at the Università di Pisa. For example, the diethylcarbamato derivative  $\text{Zn}_4(\mu_4\text{-O})(\text{O}_2\text{CNEt}_2)_6$  was prepared [A. Belforte *et al.*, *Inorg. Chem.*, 1991, **30**, 3778] by reacting finely divided zinc with  $\text{NH}_4\text{Et}_2$  and carbon dioxide under pressure at 150 °C: the resulting product was crystallographically established to have the  $\mu_4$ -oxo-centered structure, the oxo group being suggested to originate from deoxygenation of carbon dioxide. ♦ Simplified synthetic procedures were further discovered and it was found that  $\text{ZnSO}_4$  was converted to the carbamato derivative [D. Belli Dell'Amico *et al.*, *Chem. Rev.*, 2003, **103**, 3857], whose molecular structure was established by X-ray diffractometry. The synthesis was more simply carried out by solvent extraction from an aqueous solution of a soluble zinc salt in the presence of the amine under carbon dioxide. Furthermore,  $\text{ZnO}$  was reported [D. Belli Dell'Amico *et al.*, *Inorg. Chim. Acta.*, 2003, **350**, 661] to react with  $[\text{NH}_2\text{Me}_2][\text{O}_2\text{CNMe}_2]$  in MeCN leading to the crystallographically established  $\mu_4$ -oxo derivative of formula  $\text{Zn}_4(\mu_4\text{-O})(\text{O}_2\text{CNMe}_2)_6$ .

♦ A contribution from the Université de Lausanne has appeared [A. Casini *et al.*, *Dalton Trans.*, 2010, **39**, 2239] dealing with the characterisation and biological properties of gold(III) compounds containing substituted bipyridine- and bipyridylamine-based ligands, see also: A. Casini *et al.*, *J. Inorg. Biochem.*, 2008, **102**, 995.

♦ The collaboration of the Università di Cagliari with the SuperSTEM Daresbury Laboratory [D. Carta *et al.*, *Chem. Mater.*, 2009, **21**, 945] produced a paper dealing with the characterization of  $\text{CoFe}_2\text{O}_4/\text{SiO}_2$  and  $\text{NiFe}_2\text{O}_4/\text{SiO}_2$  aerogels. These nanocomposites consist of two separate phases containing ferrihydrate and the hydroxo-silicate of cobalt or nickel. ♦ The collaboration of the Università di Trieste with some Institutions located in France and USA resulted in the publication of a paper reporting the electric behaviour of mixed oxides containing lanthanum, nickel and iron, upon doping with  $\text{Sr}^{2+}$  [T. Montini *et al.*, *Chem. Mater.*, 2009, **21**, 1768]. These systems, of formula  $\text{La}_{1-x}\text{Sr}_x\text{Ni}_{0.6}\text{Fe}_{0.4}\text{O}_3$ , were prepared by co-precipitation and further calcined at 1000 °C.

♦ Methanolysis of  $\text{VCl}_4$  yielded the chloro-methoxide derivative, which can be further hydrolyzed [M. Epifani *et al.*, *Chem. Mater.*, 2009, **21**, 1618]. Thin films and microcrystalline aggregates of  $\text{V}_2\text{O}_5$  were prepared and treated at 500 °C. The resulting product was used to detect ammonia and ethanol over a broad range of concentrations. This is a contribution from several Institutions located in Spain and in Italy.

♦ The search for antitumor inorganic systems is still a hot subject. A review-article [K.S. Lovejoy, S.J. Lippard, *Dalton Trans.*, 2009, 10651] from M.I.T., Cambridge, USA, describes non-traditional platinum compounds for tumor targeting. Mention is made of the compound of formula  $\text{PtCl}(\text{CH}_3\text{COO})(\text{NH}_3)(\text{C}_6\text{H}_{11}\text{NH}_2)$ , the first oral drug

with an antitumor activity. ♦ A publication of the Università di Roma in collaboration with the University of California [F. Ricci *et al.*, *Chem. Comm.*, 2010, **46**, 1742] deals with the detection of anti-DNA antibodies providing insight into the progression of some autoimmune diseases: the use is presented of an electrochemical DNA sensor operating at nanomolar concentrations. ♦ A paper resulting from the collaboration of the Università di Firenze with the Ecole Polytechnique Fédérale de Lausanne [C.G. Hartinger *et al.*, *J. Inorg. Biochem.*, 2008, **102**, 2136] reports the interaction of  $\text{Ru}(\eta^6\text{-p-cymene})(1,3,5\text{-triaz-7-phospha-adamantane})$  with the tripeptide glutathione GSH (g-L-Glu-L-Cys-Gly) and with ubiquitin as a model protein: the corresponding adducts were studied by Fourier transform ion cyclotron resonance mass spectrometry (FT-ICR MS). ♦ An article resulting from the collaboration of the Università di Trieste with the SISSA Institution of the same town and with the CNRS Institut de Biologie Moléculaire et Cellulaire of Strasbourg [C. Samori *Chem. Comm.*, 2010, **46**, 1494] reports that the conjugation of multi-walled carbon nanotubes (MWCNT) with the anticancer drug methotrexate (MTX) using some appropriate cleavable linkers performs some cytotoxic activity for breast cancer cells. ♦ A colorimetric test for oxidized carbon nanotubes has been reported in a contribution from several Italian institutions including the Università di Torino [S. Visentin *et al.*, *Chem. Comm.*, 2010, **46**, 1443]. For this purpose, thionin acetate was contacted with the carbon nanotube as such or oxidized, carboxylic groups resulting in the latter case. Both Raman spectroscopic- and thermogravimetric analyses were used to monitor this type of interaction. ♦ Single-wall carbon nanotubes deposited on stainless-steel as new electrodes for solar cells based on the synthetic dye  $[\text{Ru}(2,2'\text{-dipyridyl-4,4'-dicarboxylic acid})_2(\text{NCS})_2]$  have been published as a contribution from the the Università di Messina in collaboration with Cambridge University [G. Calogero *et al.*, *Dalton Trans.*, 2010, **39**, 2903]: for this purpose, commercially available carbon nanotubes were used. ♦ Platinum dispersed on carbon nanotubes is also the subject of a contribution from the New Jersey Institute of Technology [Y. Chen *et al.*, *Chem. Commun.*, 2010, **46**, 1652], the uniform distribution of the metal particles being established by SEM and TEM measurements.

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