

## Compléments au dossier « La chimie en région : focus sur la section régionale SCF-PACA » (*L'Actualité Chimique*, 2013, 377, p. I-XX)

### Spectroscopies et chimie théorique, par Isabelle Couturier-Tamburelli (p. III-VI)

- [1] Raczyńska E.D., Gal J.-F., Maria P.-C., Zientara K., Szelag M., Application of FT-ICR-MS for the study of proton-transfer reactions involving biomolecules, *Anal. Bioanal. Chem.*, **2007**, 389, p. 1365.
- [2] Heyno E., Gross C.M., Laureau C., Culcasi M., Pietri S., Krieger-Liszkay A., Plastid alternative oxidase (PTOX) promotes oxidative stress when overexpressed in tobacco, *J. Biol. Chem.*, **2009**, 284, p. 31174.
- [3] Hardy M., Bardelang D., Karoui H., Rockenbauer A., Finet J.-P., Jicsinszky L., Rosas R., Ouari O., Tordo P., Improving the trapping of superoxide radical with b-cyclodextrine-DEPMPO conjugate, *Chem. Eur. J.*, **2009**, 42, p. 11114.
- [4] a) Belle V., Rouger S., Costanzo S., Longhi S., Fournel A., Assessing structures and conformations of intrinsically disordered proteins, Wiley, V.N. Uversky (ed.), **2009** ; b) Morin B., Bourhis J., Belle V., Woudstra M., Carriere F., Guigliarelli B., Fournel A., Longhi S., *J. Phys. Chem. B*, **2006**, 110, p. 20596.
- [5] Lorenzi M., Puppo C., Lebrun R., Lignon S., Roubaud V., Martinho M., Mileo E., Tordo P., Marque S.R.A., Gontero B., Guigliarelli B., Belle V., Tyrosine-targeted spin labeling and EPR spectroscopy: An alternative strategy for studying structural transitions in proteins, *Angew. Chem. Int. Ed.*, **2011**, 50, p. 9108.
- [6] D'Aléo A., Bourdolle A., Brustlein S., Fauquier T., Grichine A., Duperray A., Baldeck L., Andraud P., Bresselet C., Maury S., Ytterbium-based bioprobes for near-infrared two-photon scanning laser microscopy imaging, *Angew. Chem. Int. Ed.*, **2012**, 51, p. 6622.
- [7] Mazarin M., Viel S., Allard-Breton B., Thévand A., Charles L., Use of pulsed gradient spin-echo NMR as a tool in MALDI method development for polymer molecular weight determination, *Anal. Chem.*, **2006**, 78, p. 2758.
- [8] a) Barrere C., Mazarin M., Giordanengo T.N.T., Phan A., Thévand A., Viel S., Charles L., Determination of block copolymers by pulsed gradient spin echo NMR analytical chemistry, *Anal. Chem.*, **2009**, 81, p. 8054 ; b) Pizzala H., Barrere C., Mazarin M., Ziarelli F., Charles L., Solid state nuclear magnetic resonance as tool to explore solvent-free Maldi samples, *J. Am. Soc. for Mass spectrometry*, **2009**, 20, p. 1906.
- [9] Vanthuyne N., Roussel C., Naubron J.-V., Jagerovic N., Morales Lázaro P., Alkorta I., Elguero J., Determination of the absolute configuration of 1,3,5-triphenyl-4,5 dihydropyrazole enantiomers by a combination of VCD, ECD measurements, and theoretical calculations, *Tetrahedron: Asymmetry*, **2011**, 22, p. 1120.
- [10] Polovyanenko D.N., Marque S.R.A., Lambert S., Jicsinszky L., Plyusnin V.F., Bagryanskaya E.G., Electron paramagnetic resonance spin trapping of glutathyl radicals by PBN in the presence of cyclodextrins and by PBN attached to cyclodextrin, *J. Phys. Chem. B*, **2008**, 112, p. 13157.
- [11] El Hassan I., Charles L., Lauricella R., Tuccio B., Determination of the absolute configuration of 1,3,5-triphenyl-4,5 dihydropyrazole enantiomers by a combination of VCD, ECD measurements, and theoretical calculations, *New J. of Chemistry*, **2008**, 32, p. 680.
- [12] Triquigneaux M., Tuccio B., Lauricella R., Charles L., Nucleophile addition of reduced glutathione on 2-methyl-2-nitroso compound: A combined electron paramagnetic resonance spectroscopy and electrospray tandem mass spectrometry study, *J. Am. Soc. for Mass spectrometry*, **2009**, 20, p. 2013.
- [13] Abbas O., Rebufa C., Dupuy N., Permanyerc A., Kister J., FTIR-multivariate curve resolution monitoring of photo-Fenton degradation of phenolic aqueous solutions. Comparison with HPLC as a reference method, *Talanta*, **2008**, 754, p. 857.
- [14] Dupuy N., Galtier O., Le Dreau Y., Pinatel C., Kister J., Chemometric analysis of combined NIR and MIR spectra to characterize French olives, *Eur. J. of Lipid Science and Technology*, **2010**, 112, p. 463.
- [15] Abbas O., Rebufa C., Dupuy N., Permanyerc A., Kister J., PLS regression on spectroscopic data for the prediction of crude oil quality: API gravity and aliphatic/aromatic ratio, *Fuel*, **2012**, 98, p. 5.
- [16] Vinogradoff V., Duvernay F., Danger G., Theulé P., Chiavassa T., New insight into the formation of hexamethylenetetramine (HMT) in interstellar and cometary ice analogs, *A&A*, **2011**, 530, p. A128.
- [17] a) Couturier I., Piétri N., Kolos R., Gudipati M.S., Laboratory experiments of Titan Tholins formed by photochemistry of cyanopolyynes, *Advances in Geosciences, Planetary Science*, **2010**, 25, p. 219 ; b) Couturier-Tamburelli I., Coupeaud A., Guennoun Z., Piétri N., Aycard J.-P., La photochimie des cyanopolyynes : étape clé de la chimie interstellaire ?, *L'Act. Chim.*, **2008**, 315, p. XVII ; c) Couturier-Tamburelli I., Sessouma B., Coupeaud A., Aycard J.-P., Piétri N., Cyanoacetylenic complexes as pre-reactional species leading to the HC<sub>7</sub>N synthesis. Part II: Experimental and theoretical identifications of the HC<sub>5</sub>N:C<sub>2</sub>H<sub>2</sub> complex, *Chem. Phys.*, **2009**, 358, p. 13.
- [18] Borget F., Danger G., Duvernay F., Chomat M., Vinogradoff V., Theulé P., Chiavassa T., Aminoacetonitrile characterization in astrophysical-like conditions, *A&A*, **2012**, 541, p. A114.

- [19] Danger G., Plasson R., Pascal R., Pathways for the formation and evolution of peptides in prebiotic environments, *Chem. Soc. Rev.*, **2012**, *41*, p. 5416.
- [20] Antonczak S., Fiorucci S., Golebiowski J., Cabrol-Bass D., Theoretical investigations of the role played by quercetinase enzymes upon the flavonoids oxygenolysis mechanism, *P.C.C.P.*, **2009**, *11*, p. 1491 ; b) Topin J., Rousset M., Antonczak S., Golebiowski J., Kinetics and thermodynamics of gas diffusion in a NiFe hydrogenase, *Proteins: Structure, Function, and Bioinformatics*, **2012**, *80*, p. 677.
- [21] a) Houriez C., Ferre N., Masella M., Siri D., Prediction of nitroxide hyperfine coupling constants in solution from combined nanosecond scale simulations and quantum computation, *J. Chem. Phys.*, **2008**, *128*, p. 244504 ; b) Houriez C., Ferre N., Siri D., Masella M., Further insights into the environmental effects on the computed hyperfine coupling constants of nitroxides in aqueous solution, *J. Phys. Chem. B*, **2009**, *113*, p. 15047 ; c) Houriez C., Ferré N., Siri D., Tordo P., Masella M., Assessing the accuracy of a QM/MM/MD combined protocol to compute spectromagnetic properties of polyfunctional nitroxides in solution, *Theor. Chem. Acc.*, **2012**, *131*, p. 1240.
- [22] Ferro Y., Morisset S., Allouche A., Evidence of hydrogenated hexamers on graphite, *Chem. Phys. Lett.*, **2009**, *478*, p. 42.

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## Matériaux pour l'électronique et l'énergie, par Lionel Santinacci et Philippe Knauth (p. VII-IX)

- [1] [www.arcsis.org/cimpaca.html](http://www.arcsis.org/cimpaca.html)
- [2] [www.capenergies.fr](http://www.capenergies.fr)
- [3] [www.nexcis.fr](http://www.nexcis.fr)
- [4] [www.areva.com/FR/activites-407/helion-specialiste-de-la-pile-a-combustible-et-de-l-hydrogene.html](http://www.areva.com/FR/activites-407/helion-specialiste-de-la-pile-a-combustible-et-de-l-hydrogene.html)
- [5] Simon P., Knauth P., Tirado J.L., Plochanski J., Wieczorek W., Barnabe A., Tarascon J.M., Masquelier C., "Give energy to your study": students worldwide gather in Europe to design future materials for energy storage and conversion, *J. of Chemical Education*, **2011**, *88(9)*, p. 1203.
- [6] Barth C., Gingras M., Foster A.S., Gulans A., Felix G., Hynninen T., Peresutti R., Henry C.R., Two-dimensional nanostructured growth of nanoclusters and molecules on insulating surfaces, *Adv. Mater.*, **2012**, *24(24)*, p. 3228.
- [7] Abel M., Clair S., Ourdjini O., Mossoyan M., Porte L., Single layer of polymeric Fe-phthalocyanine: An organometallic sheet on metal and thin insulating film, *J. Am. Chem. Soc.*, **2011**, *133(5)*, p. 1203.
- [8] Clair S., Ourdjini, O., Abel M., Porte L., Two-dimensional polymer as a mask for surface nanopatterning, *Adv. Mater.*, **2012**, *24(9)*, p. 1252.
- [9] Faury T., Clair S., Abel M., Dumur F., Gignes D., Porte L., Sequential linking to control growth of a surface covalent organic framework, *J. Phys. Chem. C*, **2012**, *116(7)*, p. 4819.
- [10] Zwaneveld N.A.A., Pawlak R., Abel M., Catalin D., Gignes D., Bertin D., Porte L., Organized formation of 2D extended covalent organic frameworks at surfaces, *J. Am. Chem. Soc.*, **2008**, *130(21)*, p. 6678.
- [11] Videlot-Ackermann C., Ackermann J., Brisset H., Kawamura K., Yoshimoto N., Raynal P., El Kassmi A., Fages F., Alpha,omega-distyryl oligothiophenes: High mobility semiconductors for environmentally stable organic thin film transistors, *J. Am. Chem. Soc.*, **2005**, *127(47)*, p. 16346.
- [12] Didane Y., Mehl G.H., Kumagai A., Yoshimoto N., Videlot-Ackermann C., Brisset H., A "kite" shaped styryl end-capped benzo 2,1-b:3,4-b' dithiophene with high electrical performances in organic thin film transistors, *J. Am. Chem. Soc.*, **2008**, *130(52)*, p. 17681.
- [13] Rapp L., Diallo A.K., Alloncle A.P., Videlot-Ackermann C., Fages F., Delaporte P., Pulsed-laser printing of organic thin-film transistors, *Applied Physics Letters*, **2009**, *95(17)*.
- [14] Nasr G., Guerlin A., Dumur F., Beouch L., Dumas E., Clavier G., Miomandre F., Goubard F., Gignes D., Bertin D., Wantze G., Mayer C.R., Iridium(III) soft salts from dinuclear cationic and mononuclear anionic complexes for OLED devices, *Chem. Comm.*, **2011**, *47(38)*, p. 10698.
- [15] Moyen E., Santinacci L., Masson L., Wulfhekel W., Hanbücken M., Nanopores: A novel self-ordered sub-10 nm nanopore template for nanotechnology, *Adv. Mater.*, **2012**, *24*, p. 5094.
- [16] Banerjee P., Perez I., Henn-Lecordier L., Lee S.B., Rubloff G.W., Nanotubular metal-insulator-metal capacitor arrays for energy storage, *Nat. Nanotechnol.*, **2009**, *4*, p. 292.
- [17] Yang S.Y., Kim B.N., Zakhidov A.A., Taylor P.G., Lee J.-K., Ober C.K., Lindau M., Malliaras G.G., Detection of transmitter release from single living cells using conducting polymer microelectrodes, *Adv. Mater.*, **2011**, *23(24)*, p. H184.
- [18] Bertin D., Phan T.N.T., Bouchet R., Solid polymeric electrolytes based on triblock copolymers, in particular polystyrene-poly(oxyethylene)-polystyrene copolymers, EP 20070727552, **2008**.
- [19] Bertin D., Phan T.N.T., Bouchet R., Solid polymeric electrolytes based on triblock copolymers, especially polystyrene-poly(oxyethylene)-polystyrene, US 2010/0221614, **2010**.
- [20] Ortiz G.F., Hanzu I., Djenizian T., Lavela P., Tirado J.L., Knauth P., Alternative Li-ion battery electrode based on self-organized titania nanotubes, *Chem. Mat.*, **2009**, *21(1)*, p. 63.

- [21] Kyeremateng N.A., Hornebecq V., Knauth P., Djenizian T., Properties of Sn-doped TiO<sub>2</sub> nanotubes fabricated by anodization of co-sputtered Ti-Sn thin films, *Electrochimica Acta*, **2012**, 62, p. 192.
- [22] Kyeremateng N.A., Dumur F., Knauth P., Pecquenard B., Djenizian T., Electropolymerization of copolymer electrolyte into titania nanotube electrodes for high-performance 3D microbatteries, *Electrochem. Commun.*, **2011**, 13(8), p. 894.
- [23] Cayzac R., Boulc'h, F., Hornebecq V., Djenizian T., Bendahan M., Pasquinelli M., Knauth P., Optical absorbance enhancement by electrochemical surface roughening of CuInS<sub>2</sub> thin films, *J. Mater. Res.*, **2009**, 24(10), p. 3044.
- [24] Cayzac R., Boulc'h F., Bendahan M., Lauque R., Knauth P., Direct preparation of crystalline CuInS<sub>2</sub> thin films by radiofrequency sputtering, *Mater. Sci. Eng. B-Adv. Funct. Solid-State Mater.*, **2009**, 157(1-3), p. 66.
- [25] Said A.J., Poize G., Martini C., Ferry D., Marine W., Giorgio S., Fages F., Hocq J., Boucle J., Nelson J., Durrant J.R., Ackermann J., Hybrid bulk heterojunction solar cells based on P3HT and porphyrin-modified ZnO nanorods, *J. Phys. Chem. C*, **2010**, 114(25), p. 11273.
- [26] Mawyin J., Shupyk I., Wang M.Q., Poize G., Atienzar P., Ishwara T., Durrant J.R., Nelson J., Kanehira D., Yoshimoto N., Martini C., Shilova E., Secondo P., Brisset H., Fages F., Ackermann J., Hybrid heterojunction nanorods for nanoscale controlled morphology in bulk heterojunction solar cells, *J. Phys. Chem. C*, **2011**, 115(21), p. 10881.
- [27] Mawyin J., Shupyk I., Wang M., Poize G., Atienzar P., Ishwara T., Durrant J.R., Nelson J., Kanehira D., Yoshimoto N., Martini C., Shilova E., Secondo P., Brisset H., Fages F., Ackermann Jr., Hybrid heterojunction nanorods for nanoscale controlled morphology in bulk heterojunction solar cells, *J. Phys. Chem. C*, **2011**, 115(21), p. 10881.
- [28] Balaban T.S., Tailoring porphyrins and chlorins for self-assembly in biomimetic artificial antenna systems, *Accounts Chem. Res.*, **2005**, 38(8), p. 612.
- [29] Marek P.L., Hahn H., Balaban T.S., On the way to biomimetic dye aggregate solar cells, *Energy Environ. Sci.*, **2011**, 4(7), p. 2366.
- [30] Balaban T.S., Brau, P., Hattig C., Hellweg A., Kern J., Saenger W., Zouni A., Preferential pathways for light-trapping involving beta-ligated chlorophylls, *Biochimica et Biophysica Acta-Bioenergetics*, **2009**, 1787(10), p. 1254.
- [31] Chappaz-Gillot C., Marek P.L., Blaive B.J., Canard G., Burck J., Garab G., Hahn H., Javorfi T., Kelemen L., Krupke R., Mossinger D., Ormos P., Reddy C.M., Roussel C., Steinbach G., Szabo M., Ulrich A.S., Vanthuyne N., Vijayaraghavan A., Zupcanova A., Balaban T.S., Anisotropic organization and microscopic manipulation of self-assembling synthetic porphyrin microrods that mimic chlorosomes: Bacterial light-harvesting systems, *J. Am. Chem. Soc.*, **2012**, 134(2), p. 944.
- [32] Hou H.Y., Di Vona M.L., Knauth P., Durability of sulfonated aromatic polymers for proton-exchange-membrane fuel cells, *ChemSusChem*, **2011**, 4(11), p. 1526.
- [33] Di Vona M.L., Sgreccia E., Licocchia S., Khadhraoui M., Denoyel R., Knauth P., Composite proton-conducting hybrid polymers: Water sorption isotherms and mechanical properties of blends of sulfonated PEEK and substituted PPSU, *Chem. Mat.*, **2008**, 20(13), p. 4327.
- [34] Di Vona M.L.; Alberti G., Sgreccia E., Casciola M., Knauth P., High performance sulfonated aromatic ionomers by solvothermal macromolecular synthesis, *Int. J. Hydrog. Energy*, **2012**, 37(10), p. 8672.
- [35] Hou H., Vacandio F., Di Vona M.L., Knauth P., Sulfonated polyphenyl ether by electropolymerization, *Electrochimica Acta*, **2012**, 81, p. 58.
- [36] Miller S.R., Pearce G.M., Wright P.A., Bonino F., Chavan S., Bordiga S., Margiolaki I., Guillou N., Férey G., Bourrelly S., Llewellyn P.L., Structural transformations and adsorption of fuel-related gases of a structurally responsive nickel phosphonate metal-organic framework, Ni-STA-12, *J. Am. Chem. Soc.*, **2008**, 130(47), p. 15967.
- [37] Volkringer C., Loiseau T., Haouas M., Taulelle F., Popov D., Burghammer M., Riekel C., Zlotea C., Cuevas F., Latroche M., Phanon D., Knofel C., Llewellyn P.L., Férey G., Occurrence of uncommon infinite chains consisting of edge-sharing octahedra in a porous metal organic framework-type aluminum pyromellitate Al<sub>4</sub>(OH)<sub>8</sub>[C<sub>10</sub>O<sub>8</sub>H<sub>2</sub>] (MIL-120): Synthesis, structure, and gas sorption properties, *Chem. Mat.*, **2009**, 21(24), p. 5783.
- [38] Soldo-Olivier Y., Lafouresse M.C., De Santis M., Lebouin C., de Boissieu M., Sibert E., Hydrogen electro-insertion into Pd/Pt(111) nanofilms: An *in situ* surface X-ray diffraction study, *J. Phys. Chem. C*, **2011**, 115(24), p. 12041.
- [39] Lojou E., Hydrogenases as catalysts for fuel cells: Strategies for efficient immobilization at electrode interfaces, *Electrochimica Acta*, **2011**, 56(28), p. 10385.

- [1] Piétri N., Coupeaud A., Aycard J.P., Couturier-Tamburelli I., Cyanoacetylenic complexes as pre-reactional species leading to the HC<sub>7</sub>N synthesis. Part I: Experimental and theoretical identification of the HC<sub>3</sub>N:C<sub>4</sub>H<sub>2</sub> complexes, *Chem. Phys.*, **2009**, 358(1-2), p. 7.
- [2] Marcellus P.D., Meinert C., Nuevo M., Filippi J.-J., Danger G., Deboffle D., Nahon L., d'Hendecourt L.L.S., Meierhenrich U.J., Non-racemic amino acid production by ultraviolet irradiation of achiral interstellar ice analogs with circularly polarized light, *Astrophys. J. Lett.*, **2011**, 727(2), p. L27.
- [3] Meierhenrich U.J., Filippi J.-J., Meinert C., Vierling P., Dworkin J.P., On the origin of primitive cells: from nutrient intake to elongation of encapsulated nucleotides, *Angew. Chem. Int. Ed.*, **2010**, 49(22), p. 3738.
- [4] Chemat F., *Éco-extraction du végétal : Procédés innovants et solvants alternatifs*, Dunod, **2011**, p. 336.
- [5] Mason T.J., Chemat F., Vinatoru M., The extraction of natural products using ultrasound or microwaves, *Curr. Org. Chem.*, **2011**, 15(2), p. 237.
- [6] a) Lebovka N., Vorobiev E., Chemat F., *Enhancing extraction processes in the food industry*, CRC Press, **2011**, p. 570 ; b) Chemat F., *Essential oils and aromas: green extractions and applications*, HKB Publishers, Dehradun, **2009**, p. 311.
- [7] a) Dupuy N., Galtier O., Ollivier D., Vanloot P., Artaud J., Comparison between NIR, MIR, concatenated NIR and MIR analysis and hierarchical PLS model. Application to virgin olive oil analysis, *Anal. Chim. Acta*, **2010**, 666(1-2), p. 23 ; b) Korifi R., Le Dreau Y., Molinet J., Artaud J., Dupuy N., Composition and authentication of virgin olive oil from French PDO regions by chemometric treatment of Raman spectra, *J. Raman Spectrosc.*, **2011**, 42(7), p. 1540.
- [8] Reddy G.N.M., Caldarelli S., Maximum-quantum (MaxQ) NMR for the speciation of mixtures of phenolic molecules, *Chem. Commun.*, **2011**, 47(14), p. 4297.
- [9] Ivanišević J., Thomas O., Lejeusne C., Chevalloné P., Pérez T., Metabolic fingerprinting as an indicator of biodiversity: Towards understanding inter-specific relationships among *Homoscleromorpha* sponges, *Metabolomics*, **2011**, 7(2), p. 289.
- [10] Meinert C., Meierhenrich U.J., A new dimension in separation science: comprehensive two-dimensional gas chromatography, *Angew. Chem. Int. Ed.*, **2012**, 51, p. 10460.
- [11] Paillat L., Perichet C., Pierrat J.P., Lavoine S., Filippi J.J., Meierhenrich U., Fernandez X., Purification of vetiver alcohols and esters for quantitative high-performance thin-layer chromatography determination in Haitian vetiver essential oils and vetiver acetates, *J. Chromatogr. A*, **2012**, 1241, p. 103.
- [12] a) Castel C., Fernandez X., Filippi J.J., Brun J.P., Perfumes in Mediterranean antiquity, *Flavour Frag. J.*, **2009**, 24(6), p. 326 ; b) Castel C., Fernandez X., Filippi J.J., Brun J.P., Les parfums antiques dans le bassin méditerranéen, *L'Act. Chim.*, **2012**, 359, p. 42 ; c) Brun J.-P., Fernandez X., Amigues S., Tran N., *Le parfum retrouvé* (film, 28 min.), L. Ronat (réalisateur), CNRS Image, **2012**.
- [13] a) Cuoco G., Mathe C., Archier P., Vieillescazes C., Characterization of madder and garancine in historic French red materials by liquid chromatography-photodiode array detection, *J. Cult. Herit.*, **2011**, 12(1), p. 98 ; b) Mathe C., Archier P., Nehme L., Vieillescazes C., The study of Nabatean organic residues from Mad'In Slih, Ancient Hegra, by gas chromatography-mass spectrometry, *Archaeometry*, **2009**, 51, p. 626.
- [14] a) Chea A., Hout S., Bun S.S., Tabatadze N., Gasquet M., Azas N., Elias R., Balansard G., Antimalarial activity of alkaloids isolated from *Stephania rotunda*, *J. Ethnopharmacol.*, **2007**, 112(1), p. 132 ; b) Kaou A.M., Mahiou-Leddé V., Canlet C., Debrauwer L., Hutter S., Laget M., Faure R., Azas N., Ollivier E., Antimalarial compounds from the aerial parts of *Flacourtia indica* (Flacourtiaceae), *J. Ethnopharmacol.*, **2010**, 130(2), p. 272.
- [15] a) Berrué F., Thomas O.P., Laville R., Prado S., Golebiowski J., Fernandez R., Amade P., The marine sponge *Plakortis zygompha*: a source of original bioactive polyketides, *Tetrahedron*, **2007**, 63(10), p. 2328 ; b) Viano Y., Bonhomme D., Ortalo-Magné A., Thomas O.P., El Hattab M., Piovetti L., Blache Y., Culioli G., Dictyotadimer A, a new dissymmetric bis-diterpene from a brown alga of the genus *Dictyota*, *Tetrahedron Lett.*, **2011**, 52(9), p. 1031.
- [16] a) Candy M., Audran G., Bienayme H., Bressy C., Pons J.M., Total synthesis of (+)-Crocacin C using hidden symmetry, *J. Org. Chem.*, **2010**, 75(5), p. 1354 ; b) Pisset M., Coquerel Y., Rodriguez J., Quadrane sesquiterpenes: natural sources, biology, and syntheses, *Eur. J. Org. Chem.*, **2010**, 12, p. 2247 ; c) Commeiras L., Thibonnet J., Parrain J.L., Studies towards the total synthesis of (-)-Caulerpenynol, a toxic sesquiterpenoid of the green seaweed *Caulerpa taxifolia*, *Eur. J. Org. Chem.*, **2009**, 18, p. 2987.
- [17] a) Gellis A., Dumètre A., Lanzada G., Hutter S., Ollivier E., Vanelle P., Azas N., Preparation and antiprotozoal evaluation of promising  $\beta$ -carboline alkaloids, *Biomed. Pharmacother.*, **2012**, 66(5), p. 339 ; b) Casano G., Dumètre A., Pannecouque C., Hutter S., Azas N., Robin M., Anti-HIV and antiplasmodial activity of original flavonoid derivatives, *Bioorg. Med. Chem.*, **2010**, 18(16), p. 6012.
- [18] Genta-Jouve G., Cachet N., Holderith S., Oberhansli F., Teyssie J.L., Jeffree R., Al Mourabit A., Thomas O.P., New insight into marine alkaloid metabolic pathways: Revisiting oroidin biosynthesis, *ChemBioChem*, **2011**, 12(15), p. 2298.

- [19] Groussin A.-L., Antoniotti S., Valuable chemicals by the enzymatic modification of molecules of natural origin: Terpenoids, steroids, phenolics and related compounds, *Bioresource Technol.*, **2012**, *115*, p. 237.
- [20] Ormeno E., Fernandez C., Mevy J.P., Plant coexistence alters terpene emission and content of Mediterranean species, *Phytochemistry*, **2007**, *68(6)*, p. 840.
- [21] Ivanisevic J., Thomas O.P., Pedel L., Pénez N., Ereskovsky A.V., Culioli G., Pérez T., Biochemical trade-offs: Evidence for ecologically linked secondary metabolism of the sponge *Oscarella balibalo*, *Plos One*, **2011**, *6(11)*, p. e28059.
- [22] Pénez N., Culioli G., Pérez T., Briand J.-F., Thomas O.P., Blache Y., Antifouling properties of simple indole and purine alkaloids from the Mediterranean gorgonian *Paramuricea clavata*, *J. Nat. Prod.*, **2011**, *74(10)*, p. 2304.
- [23] Tessier E., Garnier C., Mullot J.-U., Lenoble V., Arnaud M., Raynaud M., Mounier S., Study of the spatial and historical distribution of sediment inorganic contamination in the Toulon bay (France), *Mar. Pollut. Bull.*, **2011**, *62(10)*, p. 2075.
- [24] Mamindy-Pajany Y., Hamer B., Roméo M., Géret F., Galgani F., Durmiši E., Hurel C., Marmier N., The toxicity of composted sediments from Mediterranean ports evaluated by several bioassays, *Chemosphere*, **2011**, *82(3)*, p. 362.
- [25] Kanzari F., Syakti A., Asia L., Malleret L., Mille G., Jamoussi B., Abderrabba M., Doumenq P., Aliphatic hydrocarbons, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, organochlorine, and organophosphorous pesticides in surface sediments from the Arc river and the Berre lagoon, France, *Environ. Sci. Pollut. Res.*, **2012**, *19(2)*, p. 559.
- [26] Féraud G., Potot C., Fabretti J.-F., Guglielmi Y., Fiquet M., Barci V., Maria P.-C., Trace elements as geochemical markers for surface waters and groundwaters of the Var River catchment (Alpes Maritimes, France), *C.R. Chimie*, **2009**, *12(8)*, p. 922.
- [27] Feitosa-Felizzola J., Chiron S., Occurrence and distribution of selected antibiotics in a small Mediterranean stream (Arc River, Southern France), *J. Hydrol.*, **2009**, *364(1-2)*, p. 50.
- [28] Louis Y., Garnier C., Lenoble V., Mounier S., Cukrov N., Omanović D., Pižeta I., Kinetic and equilibrium studies of copper-dissolved organic matter complexation in water column of the stratified Krka River estuary (Croatia), *Mar. Chem.*, **2009**, *114(3-4)*, p. 110.
- [29] Nicolau R., Lucas Y., Merdy P., Raynaud M., Base flow and stormwater net fluxes of carbon and trace metals to the Mediterranean sea by an urbanized small river, *Water Res.*, **2012**, *46*, p. 6625.
- [30] Al Housari F., Höhener P., Chiron S., Factors responsible for rapid dissipation of acidic herbicides in the coastal lagoons of the Camargue (Rhône River Delta, France), *Sci. Total Environ.*, **2011**, *409(3)*, p. 582.
- [31] Hassouna M., Théraulaz F., Massiani C., Production and elimination of water extractable organic matter in a calcareous soil as assessed by UV/Vis absorption and fluorescence spectroscopy of its fractions isolated on XAD-8/4 resins, *Geoderma*, **2012**, *189-190*, p. 404.
- [32] a) Vergnoux A., Guiliano M., Di Rocco R., Domeizel M., Theraulaz F., Doumenq P., Quantitative and mid-infrared changes of humic substances from burned soils, *Environ. Res.*, **2011**, *111(2)*, p. 205 ; b) Vergnoux A., Malleret L., Asia L., Doumenq P., Theraulaz F., Impact of forest fires on PAH level and distribution in soils, *Environ. Res.*, **2011**, *111(2)*, p. 193.
- [33] Net S., Alvarez E.G., Gligorovski S., Wortham H., Heterogeneous reactions of ozone with methoxyphenols, in presence and absence of light, *Artmos. Environ.*, **2011**, *45(18)*, p. 3007.
- [34] a) Gómez Alvarez E., Wortham H., Strekowski R., Zetzsch C., Gligorovski S., Atmospheric photosensitized heterogeneous and multiphase reactions: from outdoors to indoors, *Environ. Sci. Technol.*, **2011**, *46(4)*, p. 1955 ; b) Yasmeen F., Sauret N., Gal J.F., Maria P.C., Massi L., Maenhaut W., Claeys M., Characterization of oligomers from methylglyoxal under dark conditions: a pathway to produce secondary organic aerosol through cloud processing during nighttime, *Atmos. Chem. Phys.*, **2010**, *10(8)*, p. 3803.
- [35] Gómez Alvarez E., Moreno M.V., Gligorovski S., Wortham H., Cases M.V., Characterisation and calibration of active sampling solid phase microextraction applied to sensitive determination of gaseous carbonyls, *Talanta*, **2012**, *88*, p. 252.
- [36] Vesin A., Bouchoux G., Quivet E., Temime-Roussel B., Wortham H., Use of the HS-PTR-MS for online measurements of pyrethroids during indoor insecticide treatments, *Anal. Bioanal. Chem.*, **2012**, *403(7)*, p. 1907.
- [37] Depecker G., Branger C., Margaillan A., Pigot T., Blanc S., Robert-Peillard F., Coulomb B., Boudenne J.L., Synthesis and applications of XAD-4-DAN chelate resin for the separation and determination of Se(IV), *React. Funct. Polym.*, **2009**, *69(12)*, p. 877.
- [38] Vanloot P., Branger C., Margaillan A., Brach-Papa C., Boudenne J.L., Coulomb B., On-line solid-phase extraction and multisyringe flow injection analysis of Al(III) and Fe(III) in drinking water, *Anal. Bioanal. Chem.*, **2007**, *389(5)*, p. 1595.
- [39] Farnet A.M., Prudent P., Ziarelli F., Domeizel M., Gros R., Solid-state <sup>13</sup>C NMR to assess organic matter transformation in a subsurface wetland under cheese-dairy farm effluents, *Bioresource Technol.*, **2009**, *100(20)*, p. 4899.
- [40] Mounier S., Zhao H.Y., Garnier C., Redon R., Copper complexing properties of dissolved organic matter: PARAFAC treatment of fluorescence quenching, *Biogeochemistry*, **2011**, *106(1)*, p. 107.

- [41] Vergnoux A., Dupuy N., Guiliano M., Vennetier M., Théraulaz F., Doumenq P., Fire impact on forest soils evaluated using near-infrared spectroscopy and multivariate calibration, *Talanta*, **2009**, *80*(1), p. 39.
- [42] a) Feitosa-Felizzola J., Temime B., Chiron S., Evaluating on-line solid-phase extraction coupled to liquid chromatography-ion trap mass spectrometry for reliable quantification and confirmation of several classes of antibiotics in urban wastewaters, *J. Chromatogr. A*, **2007**, *1164*(1-2), p. 95 ; b) Buco S., Moragues M., Sergent M., Doumenq P., Mille G., An experimental design approach for optimizing polycyclic aromatic hydrocarbon analysis in contaminated soil by pyrolyser-gas chromatography-mass spectrometry, *Environ. Res.*, **2007**, *104*(2), p. 209.

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## Catalyse et synthèse asymétrique, par Thierry Constancieux et Elisabel Duñach (p. XIV-XVII)

- [1] Gatineau D., Giordano L., Buono G., Bulky optically active p-stereogenic phosphine-boranes from pure H-menthylphosphinates, *J. Am. Chem. Soc.*, **2011**, *133*, p. 10728.
- [2] Achard T., Lepronier A., Gimbert Y., Clavier H., Giordano L., Tenaglia A., Buono G., A regio- and diastereoselective platinum-catalyzed tandem [2+1]/[3+2] cycloaddition sequence, *Angew. Chem. Int. Ed.*, **2011**, *50*, p. 3552.
- [3] Gingras M., Placide V., Raimundo J.-M., Bergamini G., Ceroni P., Balzani V., Polysulfurated pyrene-colored dendrimers: Luminescent and electrochromic properties, *Chem. Eur. J.*, **2008**, *14*, p. 10357.
- [4] Aubert C., Dallaire C., Pèpe G., Levillain E., Félix G., Gingras M., Multivalent sulfur-rich pybox asterisk ligands in asymmetric metal catalysis, *Eur. J. Org. Chem.*, **2012**, *31*, p. 6145.
- [5] Gingras M., Félix G., Peresutti R., One hundred years of helicene chemistry. Part 2: Stereoselective syntheses of carbohelicenes and chiral separations, *Chem. Soc. Rev.*, **2013**, *42*, p. 1007.
- [6] Gingras M., One hundred years of helicene chemistry. Part 3: Applications and properties, *Chem. Soc. Rev.*, **2013**, *42*, p. 1051.
- [7] Bartoli A., Rodier F., Commeiras L., Parrain J.-L., Chouraqui G., Construction of spirolactones with concomitant formation of the fused quaternary centre – Application to the synthesis of natural products, *Nat. Prod. Rep.*, **2011**, *28*, p. 763.
- [8] Bartoli A., Chouraqui G., Parrain J.-L., Collective domino approach toward the core of molecules isolated from the genus *Schisandra*, *Org. Lett.*, **2012**, *14*, p. 122.
- [9] Muratore A., Clinet J.-C., Duñach E., Synthesis of new *exo*- and *endo*-3,8-dihydro- $\beta$ -santalols and other norbornyl-derived alcohols, *Chemistry & Biodiversity*, **2010**, *7*, p. 623.
- [10] a) Grau F., Bayon J.-C., Aguirre P.A., Parella T., Duñach E., New aldehydes by catalytic diene cycloisomerisations, *Eur. J. Org. Chem.*, **2008**, *7*, p. 1214 ; b) Mane J., Muratore A., Dunach E., Clinet J.-C., PCT WO, **2009**/138657 A1.
- [11] a) Yamamoto H., *Lewis Acids in Organic Synthesis*, Vol. 1 & 2, **2000**, p. 994 ; *Selectivity in Lewis Acid Promoted Reactions*, M. Santelli, J.-M. Pons (eds), **1995** ; b) Akiyama T., Stronger Brønsted acids, *Chem. Rev.*, **2007**, *107*, p. 5744 ; b) *Acid Catalysis in Modern Organic Synthesis*, Vol. 1 & 2, H. Yamamoto, K. Ishihara (eds), **2008**.
- [12] a) Desmurs J.R., Duñach E., Olivero S., Antoniotti S., *PCT Int. Appl.*, **2012**, WO 2012010752 A1 20120126 ; b) Legrave N., Couhert A., Olivero S., Desmurs J.R., Duñach E., Efficient preparation of anhydrous metallic triflates and triflimides under ultrasonic activation, *Eur. J. Org. Chem.*, **2012**, *5*, p. 901 ; c) Antoniotti S., Duñach E., Facile preparation of metallic triflates and triflimidates by oxidative dissolution of metal powders, *Chem. Commun.*, **2008**, p. 993.
- [13] a) Antoniotti S., Dalla V., Duñach E., Metal triflimidates: Better than metal triflates as catalysts in organic synthesis - The effect of a highly delocalized counteranion, *Angew. Chem. Int. Ed.*, **2010**, *49*, p. 7860 ; b) Antoniotti S., Poulain-Martini S., Duñach E., Electrophilic functionalization of non-activated olefins catalyzed by Lewis superacids, *Synlett*, **2010**, p. 2973.
- [14] a) Cacciuttolo B., Poulain-Martini S., Duñach E., Efficient intramolecular hydroarylation catalysed by  $\text{Bi}^{\text{III}}$  triflate, *Eur. J. Org. Chem.*, **2011**, *20-21*, p. 3710 ; b) Vece V., Ricci J., Martini S., Nava P., Carissan Y., Humbel S., Duñach E.,  $\text{In}^{\text{III}}$ -catalyzed tandem C-C and C-O bond formation between phenols and allylic acetates, *Eur. J. Org. Chem.*, **2010**, *32*, p. 6239.
- [15] Coulombel L., Rajzmann M., Pons J.-M., Olivero S., Duñach E., Aluminium(III) trifluoromethanesulfonate as an efficient catalyst for the intramolecular hydroalkoxylation of unactivated olefins: experimental and theoretical approaches, *Chem. Eur. J.*, **2006**, *24*, p. 6356.
- [16] Coulombel L., Weiwer M., Duñach E., Aluminium triflate-catalysed cyclisation of unsaturated alcohols: Novel synthesis of rose oxide and analogues, *Eur. J. Org. Chem.*, **2009**, *33*, p. 5788.
- [17] Weiwer M., Coulombel L., Duñach E., Regioselective indium(III) trifluoromethanesulfonate-catalyzed hydrothiolation of non-activated olefins, *Chem. Commun.*, **2006**, p. 332.
- [18] Weiwer M., Chaminade X., Bayón J.-C., Duñach E., Indium triflate-catalysed addition of thio compounds to camphene: A novel route to 2,3,3-trimethyl-2-thiobicyclo[2.2.1]heptane derivatives, *Eur. J. Org. Chem.*, **2007**, *15*, p. 2464.

- [19] Othman R.B., Affani R., Tranchant M.J., Antoniotti S., Dalla V., Duñach E., *N*-acyliminium ion chemistry: Highly efficient and versatile carbon-carbon bond formation by nucleophilic substitution of hydroxyl groups catalyzed by Sn(NTf<sub>2</sub>)<sub>4</sub>, *Angew. Chem. Int. Ed.*, **2010**, *49*, p. 776.
- [20] Grau F., Heumann A., Duñach E., Cycloisomerisation of 1,6-dienes catalysed by superacids without additives: Easy access to polysubstituted 6-membered-ring carbocycles, *Angew. Chem. Int. Ed.*, **2006**, *118*, p. 7443.
- [21] Godeau J., Olivero S., Antoniotti S., Duñach E., Biomimetic cationic polyannulation reaction catalyzed by cyclization of 1,6-dienes, 1,6,10-trienes and aryl trienes, *Org. Lett.*, **2011**, *13*, p. 3320.
- [22] Lemièrre G., Cacciuttolo B., Belhassen E., Duñach E., Bi(OTf)<sub>3</sub>-catalysed cycloisomerization of aryl-allenes, *Org. Lett.*, **2012**, *14*, p. 2750.
- [23] Duñach E., Esteves A.P., Medeiros M.-J., Olivero S., Reductive cyclization of propargyloxy and allyloxy  $\alpha$ -bromoester derivatives using environmentally friendly electrochemical methodologies, *Green Chem.*, **2006**, *8*, p. 380.
- [24] a) Duñach E., Medeiros M.-J., Olivero S., Intramolecular reductive cyclisations using electrochemistry: Development of environmentally friendly synthetic methodologies, *New J. Chem.*, **2006**, *30*, p. 1534 ; b) Duñach E., Medeiros M.-J., Indirect electrochemical cyclisation of bromoalkoxylated derivatives mediated by nickel(II) complex in environmentally friendly medium, *Electrochim. Acta*, **2008**, *53*, p. 4470.
- [25] a) Medeiros M.J., Pintaric C., Olivero S., Duñach E., Nickel-catalysed electrochemical carboxylation of allylic acetates and carbonates, *Electrochim. Acta*, **2011**, *56*, p. 4384 ; b) Medeiros M.J., Neves C.S.S., Pereira A.R., Duñach E., Electroreductive intramolecular cyclization of bromoalkoxylated derivatives catalyzed by nickel(I) tetramethylcyclam in "green" media, *Electrochim. Acta*, **2011**, *56*, p. 4498.
- [26] Simaan J., Mekmouche Y., Herrero C., Moreno P., Aukauloo A., Delaire J.A., Réglie M., Tron T., Photoinduced multielectron transfer to a multicopper oxidase resulting in dioxygen reduction into water, *Chem. Eur. J.*, **2011**, *17*, p. 11743.
- [27] a) Berezina N., Kozma E., Furstoss R., Alphand V., Asymmetric Baeyer-Villiger biooxidation of  $\alpha$ -substituted cyanocyclohexanones: Influence of the substituent length on regio- and enantioselectivity, *Adv. Synth. Catal.*, **2007**, *349*, p. 2049 ; b) Alphand V., Wohlgemuth R., Applications of Baeyer-Villiger monooxygenases in organic synthesis, *Curr. Org. Chem.*, **2010**, *14*, p. 1928.
- [28] a) Kotic M., Stepanek V., Grulich M., Kyslik P., Archelas A., Access to enantiopure aromatic epoxides and diols using epoxide hydrolases derived from total biofilter DNA, *J. Mol. Cat. B-Enzymatic*, **2010**, *65*, p. 41 ; b) Kotic M., Archelas A., Wohlgemuth R., Epoxide hydrolases and their applications in organic synthesis, *Curr. Org. Chem.*, **2012**, *16*, p. 451.
- [29] a) Gastaldi S., Escoubet S., Vanthuynne N., Gil G., Bertrand M.P., Dynamic kinetic resolution of amines involving biocatalysis and *in situ* free radical mediated racemization, *Org. Lett.*, **2007**, *9*, p. 837 ; b) Poulhès F., Vanthuynne N., Bertrand M.P., Gastaldi S., Gil G., Chemoenzymatic dynamic kinetic resolution of primary amines catalyzed by CAL-B at 38-40 °C, *J. Org. Chem.*, **2011**, *76*, p. 7281.
- [30] a) Brémond P., Audran G., Aubin Y., Monti H., Total chemoenzymatic synthesis of (-)-3'-methylaristeromycin, *Synlett*, **2007**, p. 1124 ; b) Bourdrion J., Commeiras L., Audran G., Vanthuynne N., Hubaut J.C., Parrain J.-L., First total synthesis and assignment of the stereochemistry of crispatenine, *J. Org. Chem.*, **2007**, *72*, p. 3770 ; c) Brémond P., Audran G., Monti H., Highly efficient stereocontrolled synthesis of Danishefsky's taxol CD ring key intermediate, *J. Org. Chem.*, **2008**, *73*, p. 6033.
- [31] Douadi A., Brémond P., Lanez T., Pannecouque C., Audran G., Stereocontrolled synthesis and biological evaluation of novel carbocyclic nucleosides analogues of neplanocin F and abacavir, *Synlett*, **2011**, p. 111 ; Obame G., Pellissier H., Vanthuynne N., Bongui J.B., Audran G., Preparation of both enantiomers of a synthon for novel nucleoside analogs by enzymatic desymmetrization of a meso-diol with a methylene cyclopropane skeleton, *Tetrahedron Lett.*, **2011**, *52*, p. 1082.
- [32] Candy M., Audran G., Bienaymé H., Bressy C., Pons J.-M., Enantioselective enzymatic desymmetrization of highly functionalized meso tetrahydropyranyl diols, *Org. Lett.*, **2009**, *11*, p. 4950.
- [33] Candy M., Audran G., Bienaymé H., Bressy C., Pons J.-M., Total synthesis of (+)-crocacin C using hidden symmetry, *J. Org. Chem.*, **2010**, *75*, p. 1354.
- [34] Candy M., Tomas L., Parat S., Heran V., Bienaymé H., Pons J.-M., Bressy C., A convergent approach to (-)-callistatin A based on local symmetry, *Chem. Eur. J.*, **2012**, *18*, p. 14267.
- [35] a) Antoniotti S., Fernandez X., Duñach E., Substrate scope evaluation of hydrolases and enzymatic reaction design, *Biocat. Biotransform.*, **2008**, *26*, p. 228 ; b) Dia R.M., Belaqiz R., Romane A., Antoniotti S., Duñach E., Flavouring and odorant thiols from renewable resources by In<sup>III</sup>-catalysed hydrothioacetylation and lipase-catalysed solvolysis, *Tetrahedron Lett.*, **2010**, *51*, p. 2164.
- [36] Blanc R., Commeiras L., Parrain J.-L., N-heterocyclic carbene-mediated organocatalytic transfer of tin onto aldehydes: New access to  $\alpha$ -silyloxyalkylstannanes and  $\gamma$ -silyloxyallylstannanes, *Adv. Synth. Catal.*, **2010**, *352*, p. 661.
- [37] Blanc R., Nava P., Rajzman M., Commeiras L., Parrain J.-L., N-heterocyclic carbene mediated organocatalytic transfer of tin onto aldehydes: An easy access to syn-diols and mechanistic studies, *Adv. Synth. Catal.*, **2012**, *354*, p. 2038.

- [38] Boddaert T., Coquerel Y., Rodriguez J., Organocatalytic activity of N-heterocyclic carbenes in the Michael addition of 1,3-dicarbonyls: Application to a stereoselective spirocyclization sequence, *Adv. Synth. Catal.*, **2009**, *351*, p. 1744.
- [39] Boddaert T., Coquerel Y., Rodriguez J., N-heterocyclic carbene-catalyzed Michael additions of 1,3-dicarbonyl compounds, *Chem. Eur. J.*, **2011**, *17*, p. 2266.
- [40] a) Presset M., Coquerel Y., Rodriguez J., Syntheses and applications of functionalized bicyclo[3.2.1]octanes: thirteen years of progress, *Chem. Rev.*, **2013**, *113*, p. 525 ; b) Presset M., Coquerel Y., Rodriguez J., Single-step metalcatalyzed and organocatalyzed enantioselective construction of bicyclo[3.2.1]octanes, *ChemCatChem.*, **2012**, *4*, p. 172.
- [41] a) Baslé O., Raimondi W., Sanchez Duque M.M., Bonne D., Constantieux T., Rodriguez J., Highly diastereo- and enantioselective organocatalytic Michael addition of  $\alpha$ -ketoamides to nitroalkenes, *Org. Lett.*, **2010**, *12*, p. 5246 ; b) Sanchez Duque M.M., Baslé O., Isambert N., Gaudel-Siri A., Génisson Y., PLAquevent J.-C., Rodriguez J., Constantieux T., A cooperative participation of the amido group in the organocatalytic construction of all-carbon quaternary stereocenters by Michael addition with  $\beta$ -ketoamides, *Org. Lett.*, **2011**, *13*, p. 3296.
- [42] Raimondi W., Baslé O., Constantieux T., Bonne D., Rodriguez J., Activation of 1,2-ketoesters with Takemoto's catalyst toward Michael addition to nitroalkenes, *Adv. Synth. Catal.*, **2012**, *354*, p. 563.
- [43] [www.spectropole.u-3mrs.fr](http://www.spectropole.u-3mrs.fr) ; [www.fr-chimie.u-3mrs.fr](http://www.fr-chimie.u-3mrs.fr)
- [44] <http://ism2.univ-amu.fr/permanents/ROUSSEL.php>
- [45] <http://chirbase.u-3mrs.fr>
- [46] Evans A.C., Meinert C., Giri C., Goesmann F., Meierhenrich U.J., Chirality, photochemistry and the detection of amino acids in interstellar ice analogues and comets, *Chem. Soc. Rev.*, **2012**, *41*, p. 5447.
- [47] Meierhenrich U.J., Filippi J.-J., Meinert C., Bredehöft J.H., Takahashi J., Nahon L., Jones N.C., Hoffmann S.V., Circular dichroism of amino acids in the vacuum-ultraviolet region, *Angew. Chem. Int. Ed.*, **2010**, *49*, p. 7799.
- [48] Meinert C., Bredehöft J.H., Filippi J.-J., Baraud Y., Nahon L., Wien F., Jones N.C., Hoffmann S.V., Meierhenrich U.J., Anisotropy spectra of amino acids., *Angew. Chem. Int. Ed.*, **2012**, *51*, p. 4484.
- [49] Meinert C., Meierhenrich U.J., A new dimension in separation science: comprehensive two-dimensional gas chromatography, *Angew. Chem. Int. Ed.*, **2012**, *51*, p. 10460.

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### Chimie bioorganique et médicinale, par Ling Peng et Jacques Greiner (p. XVIII-XX)

- [1] a) Fan Y., Xia Y., Tang J., Ziarelli F., Qu F., Rocchi P., Iovanna J., Peng L., An efficient mixed-ligand Pd catalytic system to promote C-N coupling for the synthesis of *N*-arylamino-triazole nucleosides, *Chem. Eur. J.*, **2012**, *18*, p. 2221 ; b) Wan J., Xia Y., Liu Y., Wang M., Rocchi P., Yao J., Qu F., Neyts J., Iovanna J., Peng L., Discovery of novel arylethynyl-triazole ribonucleosides with selective and effective antiviral and anti-proliferative activity, *J. Med. Chem.*, **2009**, *52*, p. 1144.
- [2] a) Spadafora M., Burger A., Benhida R., Efficient synthesis of  $\alpha$ - and  $\beta$ -2'-deoxy-heteroaryl-C-nucleosides, *Synlett*, **2008**, *8*, p. 1225 ; b) Spadafora M., Mehiri M., Burger A., Benhida R., Friedel-Crafts and modified Vorbrüggen ribosylation: A short synthesis of aryl and heteroaryl-C-nucleosides, *Tetrahedron Lett.*, **2008**, *49*, p. 3967 ; c) Spadafora M., Postopalenko V., Klemchenko A., Mely Y., Burger A., Benhida R., Efficient synthesis of ratiometric fluorescent nucleosides featuring 3-hydroxy-chromone nucleobases, *Tetrahedron*, **2009**, *65*, p. 7809 ; d) Malnuit V., Duca M., Manout A., Bougrin K., Benhida R., Tandem azide-alkyne 1,3-dipolar cycloaddition-halogenation. A concise one pot three component route to 4,5-di-substituted triazolyl-nucleosides, *Synlett*, **2009**, *13*, p. 2123.
- [3] a) Vivet Boudou V., Paillart J.C., Burger A., Marquet R., In search of new inhibitors of HIV-1 replication, synthesis and study of 1-(2'-deoxy- $\beta$ -D-ribofuranosyl)-1,2,4-triazole-3-carboxamide as a selective viral mutagenic agent, *Nucleosides, Nucleotides Nucleic Acids*, **2007**, *26*, p. 743 ; b) El Safadi Y., Paillart J.C., Laumond G., Aubertin A.M., Burger A., Marquet R., Vivet Boudou V., 5-Modified-2'-dU and 2'-dC as mutagenic anti HIV-1 proliferation agents: synthesis and activity, *J. Med. Chem.*, **2010**, *53*, p. 1534 ; c) Vivet-Boudou V., Isel C., Sleiman M., Smyth R., Ben Gaied N., Barhoum P., Laumond G., Bec G., Götte M., Mak J., Aubertin A.M., Burger A., Marquet R., 8-Modified-2'-deoxyadenosine analogues induce delayed polymerization arrest during HIV-1 reverse transcription, *PLoS ONE*, **2011**, *6*, p. e27456.
- [4] a) Xia Y., Liu Y., Wan J., Wang M., Rocchi P., Qu F., Iovanna J.L., Peng L., Novel triazole ribonucleoside down-regulates heat shock protein 27 and induces potent anticancer activity on drug-resistant pancreatic cancer, *J. Med. Chem.*, **2009**, *52*, p. 6083 ; b) Xia Y., Wang M., Demaria O., Tang J., Rocchi P., Qu F., Iovanna J.L., Alexopoulou L., Peng L., A novel bitriazolyl acyclonucleoside endowed with dual antiproliferative and immunomodulatory activity, *J. Med. Chem.*, **2012**, *55*, p. 5642 ; c) Peng L., Rocchi P., Iovanna J., Xia Y., Qu F., Wan J., Liu Y., Wang M., Novel triazole nucleoside derivatives, their preparation and their application in therapeutics, brevet WO 2279193, **2009**.



- [5] a) Barral K., Priet S., Sire J., Neyts J., Balzarini J., Canard B., Alvarez K., Synthesis, *in vitro* antiviral evaluation and stability studies of novel  $\alpha$ -borano-nucleotide analogues of 9-[2-(phosphonomethoxy)ethyl]adenine (PMEA) and (R)-9-[2-(phosphonomethoxy)propyl]adenine (PMPA), *J. Med. Chem.*, **2006**, *49*, p. 7799 ; b) Canard B., Alvarez K., Barral K., Romette J.L., Neyts J., Balzarini J., Novel nucleotide analogues as precursor molecules for antivirals, PCT/IB2007/004233 ; c) Zlatev I., Dutartre H., Barvik I., Neyts J., Canard B., Vasseur J.J., Alvarez K., Morvan F., Phosphoramidate dinucleosides as hepatitis C virus polymerase inhibitors, *J. Med. Chem.*, **2008**, *51*, p. 5745 ; d) Priet S., Zlatev I., Barvik I., Geerts K., Leyssen P., Neyts J., Dutartre H., Canard B., Vasseur J.J., Morvan F., Alvarez K., 3'-Deoxy phosphoramidate dinucleosides as improved inhibitors of hepatitis C virus subgenomic replicon and NS5B polymerase activity, *J. Med. Chem.*, **2010**, *53*, p. 6608.
- [6] Upert G., Di Giorgio A., Upadhyay A., Manvar D., Pandey N., Pandey V.N., Patino N., Inhibition of HIV replication by cyclic and hairpin PNAs targeting the HIV-1 TAR RNA loop, *J. Nucleic Acids*, **2012**, article 591025 (9 pages).
- [7] a) Duca M., Malnuit V., Barbault F., Benhida R., Design of novel RNA ligands that bind stem-bulge HIV-1 TAR RNA, *Chem. Commun.*, **2010**, *46*, p. 6162 ; b) Duca M., Malnuit V., Benhida R., Targeting DNA base pair mismatch with artificial nucleobases. Recent advances and perspectives in triple helix strategy, *Org. Biomol. Chem.*, **2011**, *9*, p. 326.
- [8] a) Ouafik L., Mabrouk K., Kaafarani I., Martin P.M., Antibodies binding to adrenomedullin receptors and uses thereof as drugs, Brevet EP 2318440, **2009** ; b) Kaafarani I., Fernandez-Sauze S., Berenguer C., Chinot O., Delfino C., Dussert C., Metellus P., Boudouresque F., Mabrouk K., Grisoli F., Figarella-Branger D., Martin P.M., Ouafik L., Targeting adrenomedullin receptors with systemic delivery of neutralizing antibodies inhibits tumor angiogenesis and suppresses growth of human tumor xenografts in mice, *FASEB J.*, **2009**, *23*, p. 3424 ; c) Rjeibi I., Mabrouk K., Mosrati H., Berenguer C., Mejdoub H., Villard C., Laffitte D., Bertin D., Ouafik L., Luis J., Elayeb M., Srairi-Abid N., Purification, synthesis and characterization of AaCtx, the first chlorotoxin-like peptide from *Androctonus australis* scorpion venom, *Peptides*, **2011**, *32*, p. 656.
- [9] Anquetin G., Greiner J., Vierling P., Quinolone-based drugs against *Toxoplasma gondii* and *Plasmodium spp.*, *Curr. Drug Targets: Infect. Disor.*, **2005**, *5*, p. 227.
- [10] a) Anquetin G., Rouquayrol M., Mahmoudi N., Santillana-Hayat M., Gozalbes R., Greiner J., Farhati K., Deroin F., Guedj R., Vierling P., Synthesis of new fluoroquinolones and evaluation of their *in vitro* activity on *Toxoplasma gondii* and *Plasmodium spp.*, *Bioorg. Med. Chem. Lett.*, **2004**, *14*, p. 2773 ; b) Anquetin G., Greiner J., Mahmoudi N., Santillana-Hayat M., Gozalbes R., Farhati K., Deroin F., Aubry A., Cambau E., Vierling P., Design, synthesis and activity against *Toxoplasma gondii*, *Plasmodium spp.*, and *Mycobacterium tuberculosis* of new 6-fluoroquinolones, *Eur. J. Med. Chem.*, **2006**, *41*, p. 1478.
- [11] a) Vierling P., Greiner J., Prodrugs of HIV protease inhibitors, *Curr. Pharm. Design*, **2003**, *9*, p. 1755 ; b) Roche D., Greiner J., Aubertin A.M., Vierling P., Synthesis and *in vitro* biological evaluation of mannose containing prodrugs derived from clinically used HIV-protease inhibitors with improved transepithelial transport, *Bioconjugate Chem.*, **2006**, *17*, p. 1568 ; c) Roche D., Greiner J., Aubertin A.M., Vierling P., Synthesis and *in vitro* biological evaluation of valine containing, prodrugs derived from clinically used HIV-protease inhibitors, *Eur. J. Med. Chem.*, **2008**, *43*, p. 1506.
- [12] a) Clement B., Trimaille T., Alluin O., Gignes D., Mabrouk K., Feron F., Decherchi P., Marqueste T., Bertin D., Convenient access to biocompatible block copolymers from SG1-based aliphatic polyester macro-alkoxyamines, *Biomacromolecules*, **2009**, *10*, p. 1436 ; b) Clement B., Decherchi P., Feron F., Bertin D., Gignes D., Trimaille T., Marqueste T., Poly(D,L-lactide)-block-poly(2-hydroxyethyl acrylate) block copolymers as potential biomaterials for peripheral nerve repair: *in vitro* and *in vivo* degradation studies, *Macromol. Biosci.*, **2011**, *11*, p. 1175 ; c) Handke N., Trimaille T., Luciani E., Rollet M., Delair T., Verrier B., Bertin D., Gignes D., Elaboration of densely functionalized polylactide nanoparticles from *N*-acryloxysuccinimide-based block copolymers, *J. Polym. Sci. Part A: Polym. Chem.*, **2011**, *49*, p. 1341.
- [13] Vierling P., Santaella C., Greiner J., Highly fluorinated amphiphiles as drug and gene carrier and delivery systems, *J. Fluor. Chem.*, **2001**, *107*, p. 337.
- [14] a) Le Gourrierc L., Di Giorgio C., Greiner J., Vierling P., An efficient mixed solid-liquid phase synthesis of a heterobifunctional amphiphilic PEG-NH<sub>2</sub> derivative and its conjugation to folic acid, *Tetrahedron*, **2008**, *64*, p. 2233 ; b) Le Gourrierc L., Di Giorgio C., Greiner J., Vierling P., Formulation of PEG-folic acid coated nanometric DNA particles from perfluoroalkylated cationic dimerizable detergents and *in vitro* folate-targeted intracellular delivery, *New J. Chem.*, **2008**, *32*, p. 2027 ; c) Guilloteau N., Le Gourrierc L., Fabio K., Di Giorgio C., Greiner J., Vierling P., Efficient solid-phase synthesis of perfluoroalkylated dimerizable cationic detergents for gene delivery, *Tetrahedron Lett.*, **2009**, *50*, p. 562.
- [15] a) Guilloteau N., Le Gourrierc L., Diaz-Moscoso A., Ortiz Mellet C., Benito J.M., Di Giorgio C., Vierling P., Defaye J., Garcia Fernandez J.M., Targeted  $\beta$ -cyclodextrine-based gene delivery systems: physicochemical and transfection studies, *Human Gene Ther.*, **2008**, *19*, p. 1157 ; b) Diaz-Moscoso A., Le Gourrierc L., Gomez-Garcia M., Benito J.M., Balbuena P., Ortega-Caballero F., Guilloteau N., Di Giorgio C., Vierling P., Defaye J., Ortiz Mellet C., Garcia Fernandez J.M., Polycationic amphiphilic cyclodextrins for gene delivery: Synthesis and effect of structural

- modifications on pDNA complex stability, cytotoxicity and gene expression, *Chem. Eur. J.*, **2009**, *15*, p. 12871 ; c) Diaz-Moscoso A., Guilloteau N., Bienvenu C., Mendez-Ardoy A., Jimenez Blanco J.L., Benito J.M., Le Gourrierec L., Di Giorgio C., Vierling P., Defaye J., Ortiz Mellet C., García Fernandez J.M., Mannosyl-coated nanocomplexes from amphiphilic cyclodextrins and pDNA for site-specific gene delivery, *Biomaterials*, **2011**, *32*, p. 7263.
- [16] Yu T., Liu X., Bolcato-Bellemin A.L., Wang Y., Liu C., Erbacher P., Qu F., Rocchi P., Behr J.P., Peng L., An amphiphilic dendrimer for effective delivery of small interfering RNA and gene silencing *in vitro* and *in vivo*, *Angew. Chem. Int. Ed.*, **2012**, *51*, p. 8478.
- [17] a) Liu X., Wu J., Yamine M., Zhou J., Posocco P., Viel S., Liu C., Ziarrelli F., Fermeglia M., Pricl S., Vicotrero G., Nguyen C., Erbacher P., Behr J.P., Peng L., Structurally flexible triethanolamine core PAMAM dendrimers are effective nanovectors for DNA transfection *in vitro* and *in vivo* to the mouse thymus, *Bioconjugate Chem.*, **2011**, *22*, p. 2461 ; b) Zhou J., Wu J., Hafdi N., Behr J.P., Erbacher P., Peng L., PAMAM dendrimers for efficient siRNA delivery and potent gene silencing, *Chem. Commun.*, **2006**, *22*, p. 2362 ; c) Liu X., Posocco P., Liu C., Yu T., Wang Q., Dal Col V., Chen C., Wang Y., Rocchi P., Pricl S., Peng L., Poly(amidoamine) dendrimers as non-viral vectors for the delivery of RNA therapeutics, in *Dendrimers in Biomedical Applications*, V. Cena, B. Klajnert, L. Peng, RSC Publishing, **2013**, p. 73.
- [18] a) Ben Gaied N., Glasser N., Ramalanjaona N., Beltz H., Wolff P., Marquet R., Burger A., Mely Y., 8-Vinyl-deoxyadenosine, an alternative fluorescent nucleoside analogue to 2'-deoxyribosyl-2-aminopurine with improved properties, *Nucleic Acids Res.*, **2005**, *33*, p. 1031 ; b) Kenfack C.A., Burger A., Mely Y., Excited state properties and transitions of the fluorescent 8-vinyl adenosine in DNA, *J. Phys. Chem. B*, **2006**, *110*, 26327 ; c) Kenfack C.A., Piemont E., Ben Gaied N., Burger A., Mely Y., The time-resolved fluorescent properties of 8-vinyl-deoxyadenosine and 2-amino-deoxyribosylpurine exhibit different sensitivity to their opposite base in duplexes, *J. Phys. Chem. B*, **2008**, *112*, p. 9736.
- [19] a) Spadafora M., Postupalenko V.Y., Shvadchak V.V., Klymchenko A.S., Mely Y., Burger A., Benhida R., Efficient synthesis of ratiometric fluorescent nucleosides featuring 3-hydroxychromone nucleobases, *Tetrahedron*, **2009**, *65*, p. 7809 ; b) Kenfack C.A., Klymchenko A.S., Duportail G., Burger A., Mely Y., *Ab initio* study of the solvent H-bonding effect on ESIPT reaction and electronic transitions of 3-hydroxychromone derivatives, *Phys. Chem. Chem. Phys.*, **2012**, *14*, p. 8910 ; c) Dziuba D., Postupalenko V.Y., Spadafora M., Klymchenko A.S., Guerinéau V., Mely Y., Benhida R., Burger A., A universal nucleoside with strong two-band switchable fluorescence and sensitivity to the environment for investigating DNA interaction, *J. Am. Chem. Soc.*, **2012**, *134*, p. 10209.
- [20] Torregrossa L., Shintu L., Nambiath Chandran J., Tintaru A., Ugolini C., Magalhaes A., Basolo F., Miccoli P., Caldarelli S., Toward the reliable diagnosis of indeterminate thyroid lesions: A HRMAS NMR-based metabolomics case of study, *J. Proteome Res.*, **2012**, *11*, p. 3317.
- [21] Lorenzi M., Puppo C., Lebrun R., Lignon S., Roubaud V., Martinho M., Mileo E., Tordo P., Marque S.R.A., Gontero B., Guigliarelli B., Belle V., Tyrosine-targeted spin labeling and EPR spectroscopy: An alternative strategy for studying structural transitions in proteins, *Angew. Chem. Int. Ed.*, **2011**, *50*, p. 9108.
- [22] a) Bazzacco P., Billon-Denis E., Shivaji Sharma K., Catoire L., Mary S., Le Bon C., Point E., Baneres J.L., Durand G., Zito F., Pucci B., Popot J.L., Non-ionic homopolymeric amphipols: Application to membrane protein folding, cell-free synthesis and solution NMR, *Biochemistry*, **2012**, *51*, p. 1416 ; b) Breyton C., Pucci, B., Popot J.L., Amphipols and fluorinated surfactants: Two alternatives to detergents for studying membrane proteins *in vitro*, *Methods Mol. Biol.*, **2010**, *601*, p. 219.
- [23] a) Xia Y., Qu F., Maggiani A., Sengupta K., Liu C., Peng L., Photoactivatable phospholipids bearing tetrafluorophenylazido chromophores exhibit unprecedented protonation state-dependent <sup>19</sup>F-NMR signals, *Org. Lett.*, **2011**, *13*, p. 4248 ; b) Xia Y., Viel S., Wang Y., Ziarelli F., Laurini E., Posocco P., Qu F., Fermeglia M., Pricl S., Peng L., Rationalizing the F<sup>+</sup>S interaction discovered within a tetrafluorophenylazido-containing bola-phospholipid, *Chem. Commun.*, **2012**, *48*, p. 4284 ; c) Xia Y., Sengupta K., Maggiani A., Qu F., Peng L., A bola-phospholipid bearing tetrafluorophenylazido chromophore as a promising lipid probe for biomembrane photolabeling studies, *Org. Biomol. Chem.*, **2013**, *11*, p. 5000 ; d) Xia Y., Peng L., Photoactivatable lipid probes to study biomembranes using photoaffinity labeling, *Chem. Rev.*, **2013**, doi: 10.1021/cr300419p.