

Dr. YANN SARAZIN

CNRS Research Fellow, CR1 level
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Born 30/08/1977 in Arcachon (France)
Married, 3 children

Professional experience

- 2008- CNRS Research Fellow, *Institut des Sciences Chimiques de Rennes*
UMR CNRS 6226 – University of Rennes
2007-2008 Post-doctorate (Prof. J.-F. Carpentier), *Institut des Sciences Chimiques de Rennes*
UMR CNRS 6226 – University of Rennes
2004-2007 Post-doctorate (Prof. M. Bochmann), University of East Anglia (U.-K.).

Education and titles

- 2012 (Oct.) Research Habilitation, University of Rennes
2000–2004 Ph. D. in coordination and macromolecular chemistries
Supervisor Prof. M. Bochmann, *University of East Anglia* (U.-K.)
1999-2000 M. Sc. in organic and macromolecular chemistries, University of Lille, France

Research interests

- ✧ Coordination chemistry of oxophilic metals (groups 2, 3 and 12–14)
- ✧ Homogeneous polymerisation catalysis (olefins and bio-resourced monomers)
- ✧ Homogeneous catalysis for fine chemistry (hydroelementation, dehydrocoupling)
- ✧ Reaction mechanisms

Supervision and responsibilities

- ✧ Supervision of **4 Ph. D. students** (Total Petrochemicals grants, 2008–2011 and 2011–2014; ANR Blanc SIMI 7 grant, *GreenLake*, 2012–2015; French Ministry for Research, 2013–2016), **4 post-doc associates** (Total Petrochemicals grants, 2009 and 2010–2011; FP7-People-EIF Marie Curie grant, 2010–2013; internal grant, 2012–2014) and **4 M. Sc. students** (2010, 2012, 2013 and 2014)
- ✧ Member of the "Solution NMR" workgroup at the University of Rennes
- ✧ Member of the "X-ray Diffraction" workgroup at the University of Rennes
- ✧ Main organiser of the *Journées 2014 de Chimie de Coordination de la Société Chimique de France*

Scientific publications

- ✧ 42 publications (*h* index = 14; 839 citations) in international peer-reviewed journals, including: 2 JACS, 1 Angew. Chem. Int. Ed., 8 Chem. Eur. J, 7 Dalton Trans., 4 Organometallics...
- ✧ 6 families of PCT Int. Appl. WO patents.
- ✧ 3 book chapters

Grants and Awards

- ✧ Co-recipient of an ERC Marie Curie FP7-PEOPLE-2010-EIF grant: *ChemCatSusDe*, 2011–2013
- ✧ Co-recipient of a French ANR Blanc SIMI 7 grant: *GreenLake*, 2011–2015
- ✧ Recipient of a University of Rennes grant: *Emerging Scientific Challenges*, 2012
- ✧ Recipient of a CNRS-NSFC grant for a collaborative project with China (Pr. Dongmei Cui), 2013
- ✧ *Inorganica Chimica Acta* award for the Best Contribution by a Young Researcher, 2012

List of publications in peer-reviewed journals (since 2010)

- 42 Kinetic analysis of the living ring-opening polymerisation of L-lactide with tin(II) initiators
L. Wang, M. Bochmann, R. D. Cannon, J.-F. Carpentier, T. Roisnel, Y. Sarazin, *Eur. J. Inorg. Chem.* DOI:10.1002/ejic.201300964.
- 41 Heteroleptic alkyl and amide iminoanilide alkaline earth and divalent rare earth complexes for the catalysis of hydrophosphination and (cyclo)hydroamination reactions
B. Liu, T. Roisnel, J.-F. Carpentier, Y. Sarazin, *Chem. Eur. J.* **2013**, *19*, 13445.
- 40 Heteroleptic tin(II) initiators for the ring-opening (co)polymerization of lactide and trimethylene carbonate: Mechanistic insights from experiments and computations.
L. Wang, C. E. Kefalidis, S. Sinbandhit, V. Dorcet, J.-F. Carpentier, L. Maron, Y. Sarazin, *Chem. Eur. J.* **2013**, *19*, 13463.
- 39 Stable divalent germanium, tin and lead amino(ether)-phenolate monomeric complexes: structural features, inclusion heterobimetallic complexes, and ROP catalysis.
L. Wang, S.-C. Roşca, V. Poirier, S. Sinbandhit, V. Dorcet, T. Roisnel, J.-F. Carpentier, Y. Sarazin, *Dalton Trans.* DOI: 10.1039/c3dt51681d.
- 38 Diamido ether actinide complexes as initiators for lactide ring- opening polymerization.
C. E. Hayes, Y. Sarazin, M. J. Katz, J.-F. Carpentier, D. B. Leznoff, *Organometallics* **2013**, *32*, 1183.
- 37 Discrete divalent rare-earth cationic ROP catalysts: Ligand-dependent redox behavior and discrepancies with alkaline-earth analogues in a ligand-assisted activated monomer mechanism.
B. Liu, T. Roisnel, L. Maron, J.-F. Carpentier, Y. Sarazin, *Chem. Eur. J.* **2013**, *19*, 3986.
- 36 Alkali aminoether-phenolate complexes: synthesis, structural characterization and evidence for an activated monomer ROP mechanism.
S.-C. Roşca, D.-A. Roşca, V. Dorcet, C. M. Kozak, F. M. Kerton, J.-F. Carpentier, Y. Sarazin, *Dalton Trans.* **2013**, doi: 10.1039/c2dt32726k
- 35 Cyclohydroamination of aminoalkenes catalyzed by disilazide alkaline-earth metal complexes: Reactivity patterns and deactivation pathways.
B. Liu, T. Roisnel, J.-F. Carpentier, Y. Sarazin, *Chem. Eur. J.* **2013**, *19*, 2784.
- 34 Aluminum, calcium and zinc complexes supported by potentially tridentate iminophenolate ligands: synthesis and use in the ring-opening polymerization of lactide.
M. Bouyhayi, Y. Sarazin, O. L. Casagrande Jr, J.-F. Carpentier, *Appl. Organometal. Chem.* **2012**, *26*, 681.
- 33 Highly effective alkaline earth catalysts for the sterically governed hydrophosphonylation of aldehydes and non-activated ketones.
B. Liu, J.-F. Carpentier, Y. Sarazin, *Chem. Eur. J.* **2012**, *18*, 13259.
- 32 Allyl strontium compounds: synthesis, molecular structure and properties.
P. Jochmann, J. P. Davin, S. Maslek, T. P. Spaniol, Y. Sarazin, J.-F. Carpentier, J. Okuda, *Dalton Trans.* **2012**, *41*, 9176.
- 31 β -Diketimate alkaline-earth cationic complexes: Synthesis, structures, lactide polymerization and unusual oxidative reactivity of the ancillary ligand.
B. Liu, V. Dorcet, L. Maron, J.-F. Carpentier, Y. Sarazin, *Eur. J. Inorg. Chem.* **2012**, 3023.
- 30 When bigger is better: Intermolecular hydrofunctionalizations of activated alkenes catalyzed by heteroleptic alkaline-earth complexes.
B. Liu, T. Roisnel, J.-F. Carpentier, Y. Sarazin, *Angew. Chem. Int. Ed.* **2012**, *51*, 4943.
- 29 Heteroleptic silylamido phenolate complexes of calcium and the larger alkaline-earth metals: β -Agostic Si-H \cdots Ae stabilization and activity in the ring-opening polymerization of L-lactide.
B. Liu, T. Roisnel, J.-P. Guégan, J.-F. Carpentier, Y. Sarazin, *Chem. Eur. J.* **2012**, *18*, 6289.
- 28 Synthetic and mechanistic aspects of the immortal ring-opening polymerization of lactide and trimethylene carbonate with new homo- and heteroleptic tin(II)-phenolate catalysts.
V. Poirier, T. Roisnel, S. Sinbandhit, M. Bochmann, J.-F. Carpentier, Y. Sarazin, *Chem. Eur. J.* **2012**, *18*, 2998.

- 27 Well-defined, solvent-free cationic barium complexes: Synthetic strategies and catalytic activity in the ring-opening polymerization of lactide.
B. Liu, T. Roisnel, Y. Sarazin, *Inorg. Chim. Acta* **2012**, 380, 2 (*Young Investigator Award*).
- 26 Syndio- and isoselective coordinative chain transfer polymerization of styrene promoted by *ansa*-lanthanidocene/dialkylmagnesium systems.
Y. Sarazin, P. de Frémont, L. Annunziata, Michel Duc, J.-F. Carpentier, *Adv. Synth. Catal.* **2011**, 353, 1367.
- 25 Discrete, solvent-free alkaline-earth metal cations: Metal...fluorine interactions and ROP catalytic activity.
Y. Sarazin, B. Liu, T. Roisnel, L. Maron, J.-F. Carpentier, *J. Am. Chem. Soc.* **2011**, 133, 9069.
- 24 Well-defined syndiotactic polystyrene-*b*-atactic polystyrene stereoblock polymers.
L. Annunziata, Y. Sarazin, M. Duc, J.-F. Carpentier, *Macromol. Rapid Commun.* **2011**, 32, 751.
- 23 Isoselective styrene polymerization catalyzed by *ansa*-bis(indenyl) allyl rare earth complexes. Stereochemical and mechanistic aspects.
L. Annunziata, A.-S. Rodrigues, E. Kirillov, Y. Sarazin, J. Okuda, L. Perrin, L. Maron, J.-F. Carpentier, *Macromolecules* **2011**, 44, 3312.
- 22 Zinc and magnesium complexes supported by bulky multidentate amino-ether phenolate ligands: potent pre-catalysts for the immortal ring-opening polymerisation of cyclic esters.
V. Poirier, T. Roisnel, J.-F. Carpentier, Y Sarazin, *Dalton Trans.* **2011**, 40, 523.
- 21 *Bis*(dimethylsilyl)amide complexes of the alkaline-earth metals stabilized by β -Si-H agostic interactions: Synthesis, characterization, and catalytic activity.
Y. Sarazin, D. Roça, V. Poirier, T. Roisnel, A. Silvestru, L. Maron, J.-F. Carpentier, *Organometallics* **2010**, 29, 6569.
- 20 Metal-catalyzed immortal ring-opening polymerization of lactones, lactides and cyclic carbonates.
N. Ajellal, J.-F. Carpentier, C. Guillaume, S. M. Guillaume, M. Hérou, V. Poirier, Y. Sarazin, A. Trifonov, *Dalton Trans.* **2010**, 39, 8363.
- 19 Discrete allyl complexes of group 3 metals and lanthanides.
J.-F. Carpentier, S. M. Guillaume, E. Kirillov, Y. Sarazin, *C. R. Chimie* **2010**, 13, 608.
- 18 Discrete, base-free, cationic alkaline-earth complexes – Access and catalytic activity in the polymerization of lactide.
Y. Sarazin, V. Poirier, T. Roisnel, J.-F. Carpentier, *Eur. J. Inorg. Chem.* **2010**, 3423.
- 17 One-pot synthesis of lactide–styrene diblock copolymers via catalytic immortal ring-opening polymerization of lactide and nitroxide-mediated polymerization of styrene.
V. Poirier, M. Duc, J.-F. Carpentier, Y. Sarazin, *ChemSusChem* **2010**, 3, 579.
- 16 Water-tolerant catalyst systems for the bulk cationic polymerization of para-methylstyrene and indene. J. Vergnaud, Y. Sarazin, H. Strub, J.-F. Carpentier, *Eur. Pol. J.* **2010**, 46, 1093.

Patents (since 2010)

- 6 *Catalyst systems based on phenolate complexes for immortal ring-opening polymerization of cyclic esters and carbonates.* V. Poirier, Y. Sarazin, M. Slawinski, M. Hérou, J.-F. Carpentier, Université Rennes 1 and Total Petrochemicals, WO 2013/030324 A1 (2013).
- 5 *Use of multifunctional initiator to prepare diblock copolymers comprising a monovinylaromatic polymer block.* V. Poirier, Y. Sarazin, M. Duc, J.-F. Carpentier, WO 2012/156237 A1.
- 4 *Process to make diblock polystyrene materials comprising syndiotactic and atactic blocks.* L. Annunziata, P. De Frémont, Y. Sarazin, J.-F. Carpentier, M. Duc, Université Rennes 1 and Total Petrochemicals, WO 2012/066016 A1 (2012).
- 3 *Catalytic systems for immortal ROP of cyclic esters and cyclic carbonates.* Y. Sarazin, V. Poirier, M. Hérou, J.-F. Carpentier, CNRS and Total Petrochemicals, WO 2010/125138 A1 (2010).
- 2 *Process to make a diblock copolymer having a monovinylaromatic polymer block.* Y. Sarazin, S. Guillaume, M. Hérou, Valentin Poirier, J.-F. Carpentier, M. Duc, Université Rennes 1 and Total Petrochemicals, WO 2010/012712 A1 (2010).

Book chapters

- 3 Charge-Neutral and Cationic Complexes of Large Alkaline-Earths for Ring-Opening Polymerization and Fine Chemicals Catalysis. J.-F. Carpentier, B. Liu, Y. Sarazin, in **Hot Topics in Organometallic Chemistry: The Silver/Gold International Conference on Organometallic Chemistry Celebratory Book**, J. Wiley & Sons Ltd, Ed.: A. J. L. Pombeiro, **2013**, ISBN: 978-1-1185-1014-8.
- 2 Alkaline-Earth Metal Complexes in Homogeneous Polymerization Catalysis. J.-F. Carpentier, Y. Sarazin, in **Topics in Organometallic Chemistry, Alkaline-Earth Metal Compounds: Oddities and Applications**, Springer, Ed.: S. Harder; **2013**, ISBN: 978-3-642-36269-9.
- 1 Metal Phenolates as Polymerization Catalysts. J.-F. Carpentier, E. Kirillov, Y. Sarazin, in **Patai's Chemistry of Functional Groups, The Chemistry of Metal Phenolates**, J. Wiley & Sons Ltd, Ed.: J. Zabicky; **2014**, Online ISBN: 978-0470973585, doi: 10.1002/9780470682531.pat0606.

Conferences (since 2010)

- ✧ Participation to 7 conferences: 5 oral presentations, incl. 1 invited lecture
 - *Royal Society of Chemistry Main-Group Interest Meeting*: Oxford, UK, Sept. 2013
 - EuCOMC XX: St Andrews, UK, June-Jul. 2013
 - 95th Canadian Chemistry Conference and Exhibition: Calgary, Canada, May 2012 (invited)
 - Journées de Chimie de Coordination de la SCF, Strasbourg, Jan. 2012
 - EuCOMC XIX: Toulouse, France, Jul. 2011
 - Journées Chimie Coordination de la SCF, Angers, Feb. 2011
 - 17th International Symposium on Homogeneous Catalysis, Poznan, Poland, Jul. 2010
- ✧ 3 invited seminars:
 - *Laboratoire de Chimie de Coordination*, Toulouse, France, July 2013
 - *Shanghai East China University*, Shanghai, P. R. China, Nov. 2013
 - *Changchun Institute of Applied Chemistry*, Changchun, P. R. China, Nov. 2013

Current projects

- ✧ *Divalent rare- and alkaline-earth complexes: Design, reactivity and catalysis of ROP reactions.*
Financial support: CNRS-NSFC (P. R. China), International Exchange Program, 5 k€.
- ✧ *Alkaline-earth catalysts for fine chemical catalysis: design and implementation.*
1 Ph. D. student, C. Bellini: grant from the French Ministry for Research, 2013–2016.
- ✧ *New trivalent catalysts for the synthesis of stereo-block and stereo-complexed poly(lactide)s.*
1 Ph. D. student, N. Maudoux: Total Petrochemicals grant, 2011–2014.
- ✧ *Alkaline-earth complexes supported by fluorinated ancillary ligands: synthesis and reactivity.*
1 Ph. D. student, S. Roşca: ANR Blanc SIMI 7 grant (*GreenLake*), 2012–2015.
- ✧ *Mechanisms of ring-opening polymerisation reactions catalyzed by tin(II) complexes*
1 post-doc, Dr. L. Wang: internal grant, 2012–2014.
- ✧ *Divalent tetrel complexes for the polymerisation of biomonomers*
1 M. Sc. student, Sami Fadlallah, 2013–2014.

Current collaborations and networking

- ✧ Collaborations with the groups of:
 - Prof. L. Maron, LCPNO, Toulouse, France; 6 publications, 3 in preparation
 - Prof. J. Okuda, RTH Aachen, Germany; 3 publications
 - Prof. M. Etienne, LCC, Toulouse, France; ANR SIMI 7 *GreenLake*; 1 publication in preparation
 - Prof. M. Bochmann, University of East Anglia, Norwich, UK; 2 publications, 2 in preparation
 - Prof. A. Silvestru, University Babes-Bolyai, Cluj-Napoca, Romania
- ✧ In 2013, set-up of a collaborative network with Prof. D. Cui (Changchun Institute of Applied Chemistry, P. R. China). Financial support from CNRS (France) and NSFC (P. R. China).