

Born 13 Sept. 1980

Personal web-page :

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## RESEARCH TOPICS

**2009 -  
present**

**Associate professor**

Ecole Nationale Supérieure de Chimie de Rennes, (ENSCR)  
UMR, CNRS 6226 Rennes Institute of Chemical Sciences  
Chemistry and Engineering of Processes

**Solid-fluid interfaces: interactions and reactions**  
**Experimental studies and modeling**

Main topics

- Synthesis and characterization of new types of adsorbents and solids
- Study the chemical and physical mechanisms at the solid-fluid interfaces
- Optimization of the processes and intensification of the heat and mass transfers

Research projects

- Removal of trace organic compounds for the production of drinking water
- Purification of biogases
- Electrochemical regeneration of spent adsorbents
- Adsorption and reactivity of organic compounds onto iron oxides
- Optimization of the adsorption process for the removal of volatile organic compounds
- Absorption in organic solvents and ionic liquids
- Synthesis and performances of new types of adsorbents

National, European financial supports and industrial collaborations

International partners: Universidad Autónoma de Nuevo León (Mexico), Institut de Technologie du Cambodge (Cambodia), Université Nangui Abrogoua (Ivory Coast), MAST Carbon (UK), University of Alicante (Spain), , University of Queensland (Australia), University of Auckland (New-Zealand), University of Chemical Technology (Bulgaria)

**2007 – 2009** University of Queensland, Division of Chemical Engineering, Australian Research Council  
Centre of Excellence for Functional Nanomaterials, Brisbane, Australia

Postdoctoral fellowship

**Tailoring ordered mesoporous carbons for hydrogen storage**

Objectives

- Modification of the composition of the carbonaceous adsorbents (metal nanoparticles, functional groups)
- Synthesis of new order mesoporous materials and graphene
- Evaluation of the adsorption capacities (physisorption, chemisorption, electrosorption)

Australian consortium between 8 universities

**2003 – 2006** Ecole des Mines de Nantes, Département Systèmes Énergétiques et Environnement, France  
University of Ottawa, Department of Chemical Engineering, Canada

**Safety and performances of the adsorption process for the removal of volatile organic compounds (VOC) by activated carbons**

Objectives

- Modeling the combined heat and mass transfers during the adsorption of VOC
- Prediction of the process efficiency and the associated risks of excessive warming
- Building a numerical tool for the French Agency of Environment and Energy Control

**2003** Institut National de la Recherche Agronomique (INRA), Nantes, France, 6-month internship  
**Emulsification by inversed ultrafiltration**

## TEACHING ACTIVITIES

**2009-present** Lectures and practical works  
Ecole Nationale Supérieure de Chimie de Rennes (250 – 350 hours/year):  
- Water chemistry, adsorption processes, mass transfers, distillation, crystallization, heat exchangers, process control, chemical engineering, chemistry, mathematics  
University of Chemical Technologies and Metallurgy, Sofia, Bulgaria  
- Chemistry (complexation and precipitation)

Development of practical works for primary schools

**2004 – 2006** Ecole des Mines de Nantes:  
- Tutorial: process control  
- Practicum: process control, statistics

## MANAGEMENT AND ADMINISTRATION

**Since 2009** Number of PhD students supervised: 18  
Number of master students supervised: 24  
Recruitment of international students (China, India, Bulgaria, Poland, Czech Republic)  
Examination of PhD thesis: 3 (New Zealand, Mexico, France)

**2012 – 2014** Scientific management of a European program with 7 partners (UK, Spain, France)

**2015 – 2017** Leader for quality policy and ISO 9001 certification for the research activities of ENSCR

**2011 – 2016** Elected in the scientific committee of ENSCR

**2017 – 2019** Scientific advisor for humanitarian project in Cambodia (production of drinking)

**2017, 2018** Nominated expert by the EU commission for the “Clean Sky II” program

**2017-2020** Manager for students’ mentoring – new approaches of learning (project DESIR)

**2017-2021** Practical chemistry in primary schools (project MERITE)

**Since 2022** Director of International Relations and Cooperation (ENSCR)

## EDUCATION

- 2004 – 2006** PhD in Chemical Engineering  
Ecole des Mines de Nantes, France
- 2003 – 2004** University of Ottawa, Canada  
Master in environmental engineering (Carleton University–University of Ottawa) (12 credits)
- Numerical methods in transport phenomena
  - Operation units in water and wastewater treatment
  - Unsaturated and multi-phase flow in porous media
  - Advanced water treatment
- 2002 – 2003** Master in Water Chemistry  
Ecole Supérieure d'Ingénieurs de Poitiers, France
- 2001 – 2002** Master in Chemical Engineering  
University of Nantes, France

## PUBLICATIONS

### BOOK CHAPTER

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- N.E. Davila-Guzman, S. Giraudet, A.A. Rico-Barragan, N. Tiempos-Flores, Chapter 8 - Water stable metal-organic frameworks based materials for sorption and degradation of personal care products, In: **Water-Stable Metal-Organic Frameworks (WSMOFs)**. Elsevier, ed. T. Rasheed, C. Verma, L. Guo, C. Mustansar Hussain, pp 187-230, 2026.
- S. Giraudet, P. Le Cloirec. Activated carbon filter for filtration – adsorption. In: **Activated Carbon Fiber and Textiles**, Woodhead Publishing, ed. J.Y. Chen. Elsevier Inc., pp.211-243, 2016.

### PUBLICATIONS

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- [1] A.A. Rico-Barragan, P. Rivas-García, S. Giraudet. Sustainable removal of ferulic acid using spent coffee grounds: equilibrium, kinetics, and thermodynamics studies. *Chemical Engineering Communications*, 1-16, 2025.
- [2] J. Couleaud, A. Fabien, C. Cordier, V. Bebing, N. Cimetière, F. Chenier, F. Girardin, S. Giraudet, V. Héquet, P. Le Cloirec, H. Leroy, M. Monnot, C. Stavrakakis, D. Wolbert, P. Moulin, Ultrafiltration and activated carbon to secure shellfish hatcheries, *Separation and Purification Technology* (378),134785, 2025.
- [3] L. Domergue, A. Georgi, A. Schierz, N. Cimetiere, S. Giraudet, D. Hauchard. Regeneration of the adsorption properties of hydrophobic zeolites for the treatment of diclofenac by Fenton-like process: Influence of Fenton catalyst location. *Separation and Purification Technology* (379),134557, 2025.
- [4] L. Domergue, N. Cimetiere, S. Giraudet, D. Hauchard. Determination of hydrogen peroxide by differential pulse polarography in advanced oxidation processes for water treatment. *Journal of Water Process Engineering* (53), 103707, 2023.
- [5] S. Pioquinto-García, J.R. Álvarez, A.A. Rico-Barragán, S. Giraudet, J.M. Rosas-Martínez, M. Loredo-Cancino, E. Soto-Regalado, V. M. Ovando-Medina, T. Cordero, J. Rodríguez-

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- Mirasol, N.E. Dávila-Guzmán, Electrospun Al-MOF fibers as D4 Siloxane adsorbent: Synthesis, environmental impacts, and adsorption behavior, *Microporous and Mesoporous Materials* (348), 112327, 2023.
- [6] L. Domergue, N. Cimetiere, S. Giraudet, P. Le Cloirec. Adsorption onto granular activated carbons of a mixture of pesticides and their metabolites at trace concentrations in groundwater. *Journal of Environmental Chemical Engineering*, 10 (5), 108218, 2022.
- [7] D. Sang, N. Cimetiere, Sylvain Giraudet, R. Tan, Dominique Wolbert, P. Le Cloirec. Adsorption-desorption of organic micropollutants by powdered activated carbon and coagulant in drinking water treatment. *Journal of Water Process Engineering* (49), 103190, 2022.
- [8] D. Sang, N. Cimetiere, S. Giraudet, R. Tan, D. Wolbert, P. Le Cloirec. Online SPE-UPLC-MS/MS for herbicides and pharmaceuticals compounds' determination in water environment: A case study in France and Cambodia. *Environmental Advances*, 8, 100212, 2022.
- [9] S. Pioquinto-García, L.A. Garza-Rodríguez, D. Bustos-Martínez, F.J. Cerino-Córdova, E. Soto-Regalado, S. Giraudet, N. Dávila-Guzmán. Siloxane removal for biogas purification by low cost mineral adsorbent. *Journal of Cleaner Production*, 286, 1249490, 2021.
- [10] S. Pioquinto-García, J. María-Rosas, M. Loredó-Cancino, S. Giraudet, E. Soto-Regalado, P. Rivas-García, N. Dávila-Guzmán. Environmental assessment of metal-organic framework DUT-4 synthesis and its application for siloxane removal. *Journal of Environmental Chemical Engineering*, 9(6), 106601, 2021.
- [11] H. Fallou, S. Giraudet, N. Cimetiere, D. Wolbert. Adsorption onto ACFC of mixture of pharmaceutical residues in water - experimental studies and modelling. *Environmental Technology*, 42, 18, 2845-2855, 2021.
- [12] M. Kamagate, A. Assadi, T. Kone, L. Coulibaly, S. Giraudet, K. Hanna. Use of laterite as a sustainable catalyst for removal of fluoroquinolone antibiotics from contaminated water. *Chemosphere*, 195, 847-853, 2018.
- [13] P.-F. Biard, A. Couvert, S. Giraudet. Volatile organic compounds absorption in packed column: theoretical assessment of water, DEHA and PDMS 50 as absorbents. *Journal of Industrial and Engineering Chemistry*, 59, 70-78, 2018.
- [14] G. Le Bozec, S. Giraudet, L. Le Polles, P. Le Cloirec. <sup>1</sup>H NMR investigations of activated carbon loaded with volatile organic compounds: quantification, mechanisms, and diffusivity determination. *Langmuir*, 33(7), 1605-1613, 2017.
- [15] P.-F. Biard, A. Coudon, A. Couvert, S. Giraudet. A simple and timesaving method for the mass-transfer assessment of solvents used in physical absorption. *Chemical Engineering Journal*, 290, 302-311, 2016.
- [16] M. Moueli, S. Giraudet, A. Amrane, B. Hamrouni. Competitive adsorption between fluoride and natural organic matter onto activated alumina. *Environmental Technology*, 2016.
- [17] H. Fallou, N. Cimetière, S. Giraudet, D. Wolbert, P. Le Cloirec. Adsorption of pharmaceuticals onto activated carbon fiber cloths - Modeling and extrapolation of adsorption isotherms at very low concentrations. *Journal of Environmental Management*, 166, 544-55, 2016.
- [18] A. Kane, S. Giraudet, J.-B. Vilmain, P. Le Cloirec. Intensification of the temperature-swing adsorption process with a heat pump for the recovery of dichloromethane, *Journal of Environmental Chemical Engineering*, 3(2), 734-743, 2015.
- [19] S. Giraudet, B. Boulinguez, P. Le Cloirec. Adsorption and electrothermal desorption of volatile organic compounds and siloxanes onto an activated carbon fiber cloth for biogas purification. *Energy Fuels*, 28(6), 3924-3932, 2014.

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- [20] N. Cimetiere, S. Giraudet, M. Papazoglou, H. Fallou, A. Amrane, P. Le Cloirec. Analysis of chlordecone by LC/MS–MS in surface and wastewaters. *Journal of Environmental Chemical Engineering*, 2(2), 849–856, 2014.
- [21] M. Usman, S. Martin, N. Cimetière, S. Giraudet, V. Chatain, K. Hanna. Sorption of nalidixic acid onto micrometric and nanometric magnetites: experimental study and modeling. *Applied Surface Science* 299, 136-145, 2014.
- [22] S.G. Ramalingam, L. Hamon, P. Pré, S. Giraudet, L. Le Coq, P. Le Cloirec. Global statistical predictor model for characteristic adsorption energy of organic vapors–solid interaction: Use in dynamic process simulation. *Journal of Colloid and Interface Science*, 377(1), 375–378, 2012.
- [23] S.G. Ramalingam, P. Pré, S. Giraudet, L. Le Coq, P. Le Cloirec, O. Baudouin, S. Déchelotte. Different families of volatile organic compounds pollution control by microporous carbons in temperature swing adsorption processes. *Journal of Hazardous Materials*, 221–222, 242–247, 2012.
- [24] P. Le Cloirec, P. Pré, F. Delage, S. Giraudet. Visualization of the exothermal VOC adsorption into a fixed bed activated carbon adsorber, *Environmental Technology*, 33(3), 285-290, 2012.
- [25] S.G. Ramalingam, P. Pré, S. Giraudet, L. Le Coq, P. Le Cloirec, O. Baudouin, S. Déchelotte. Recovery comparisons - Hot nitrogen vs steam regeneration of toxic dichloromethane from activated carbon beds in oil sands process. *Journal of Hazardous Materials*, 205-206, 222-228, 2012.
- [26] B. Boulinguez, S. Giraudet, P. Le Cloirec. Procédé d’adsorption – électrodésorption sur textiles de carbone activé pour l’élimination des COV indésirables dans les biogaz. *Récents Progrès en Génie des Procédés*. 101, 2011.
- [27] S.G. Ramalingam, J. Saussac, P. Pré, S. Giraudet, L. Le Coq, P. Le Cloirec, S. Nicolas, O. Baudouin, S. Déchelotte, A. Medevielle. Hazardous dichloromethane recovery in combined temperature and vacuum pressure swing adsorption process. *Journal of Hazardous Materials*, 198, 95-102, 2011.
- [28] S. Giraudet, Z. Zhu. Electrochemical hydrogen adsorption onto graphene nanosheets. *Journal of Nano Energy and Power Research*, 1(1),82–84, 2011.
- [29] S. Giraudet, Z. Zhu. Hydrogen adsorption in nitrogen enriched ordered mesoporous carbons doped with nickel nanoparticles. *Carbon*, 49(2), 398-405, 2011.
- [30] S. Giraudet, Z. Zhu, X. Yao, G. Lu. Ordered mesoporous carbons enriched with nitrogen: Application to hydrogen storage. *Journal of Physical Chemistry C*, 114(18), 8639–8645, 2010.
- [31] S. Giraudet, P. Pré, P. Le Cloirec. Modeling the temperature dependence of adsorption equilibriums of VOC(s) onto activated carbons. *Journal of Environmental Engineering*, 136(1), 103-111, 2010.
- [32] S. Giraudet, P. Pré and P. Le Cloirec. Modeling the heat and mass transfers in temperature-swing adsorption of volatile organic compounds onto activated carbons. *Environmental Science and Technology*, 43(4), 1173-1179, 2009.
- [33] S. Giraudet, P. Pré, H. Tezel and P. Le Cloirec. Estimation of adsorption energies using physical characteristics of activated carbons and VOCs’ molecular properties. *Carbon*, 44(10), 1873-1883, 2006.
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- [35] S. Bérot, S. Giraudet, A. Riaublanc, M. Anton, Y. Popineau. Key factors in membrane emulsification. *Trans International Chemical Engineers*, 81 part A, 1077-1082, 2003.