

Benjamin LE OUAY, Ph.D.

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Research Experience

University of Tokyo, Japan

Apr. 2018 – Present

Project-Attached Assistant Professor

Separation of Polymers by Insertion into MOFs

Advisor: Prof. Takashi Uemura

Kyoto University, Japan

May 2015 – Apr. 2018

Post-Doctoral Fellow

Preparation of Functional Polymer@MOF composites

Advisor: Prof. Susumu Kitagawa and Prof. Takashi Uemura

Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Feb. 2013 – Feb. 2015

Post-Doctoral Fellow

Controlling the Surface properties of Nanoparticles: Applications in Endodontic Treatment

Advisor: Prof. Francesco Stellacci

Collège de France / University Paris 6, France

Oct. 2009 – Dec. 2012

Graduate Student – Ph.D. thesis

Design of Bio Fuel Cells Embedding Living Micro-Organisms into Sol-Gel Matrices

Advisor: Prof. Christel Laberty-Robert and Prof. Thibaud Coradin

Collège de France / University Paris 6, France

Feb. 2009 – Jul. 2009

Visiting Graduate Student – M2 Thesis

Encapsulation of Micro-algae on Permselective Membranes

Advisor: Prof. Christel Laberty-Robert and Prof. Thibaud Coradin

University of St Andrews, United Kingdom

May 2008 – Jul. 2008

Visiting Graduate Student – M1 Thesis

Synthesis of Zeolites in Ionic Liquids

Advisor: Prof. Russel E. Morris

University of Versailles, France

Jun. 2009 – Jul. 2009

Visiting Undergraduate Student

Synthesis of MOFs with RedOx-Active Ligands

Advisor: Prof. Thomas Devic and Prof. G. Férey

Education

- University Paris 6, France 2012
Ph.D. Materials Chemistry
- Ecole Normale Supérieure de Lyon (ENS Lyon), France 2009
Diploma. Chemistry. Rewarding the completion of the M.S. and B.S. degree.
- University Lyon 1, France 2009
Master's degree. Chemistry, specialization in Materials Chemistry. Delivered jointly with ENS Lyon.
- University Lyon 1, France 2007
Bachelor's degree. Chemistry. Delivered jointly with ENS Lyon.
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Scientific Publications

- 1 – Le Ouay, B.; Takaya, H.; Uemura, T. “Controlling the Packing of Metal-Organic Layers by Inclusion of Polymer Guests” *J. Am. Chem. Soc.* **2019**, *141*, 14549-14553.
- 2 – Le Ouay, B.; Watanabe, C.; Mochizuki, S.; Takayanagi, M.; Nagaoka, M.; Kitao, T.; Uemura, T. “Selective Sorting of Polymers with Different Terminal Groups using Metal-Organic Frameworks” *Nat. Commun.* **2018**, *9*, 3635.
- 3 – Le Ouay, B.; Uemura, T. “Polymer in MOF Nanospace: From Controlled Chains Assembly to New Functional Materials” *Isr. J. Chem.* **2018**, *58*, 995-1009.
- 4 – Le Ouay, B.; Kitagawa, S.; Uemura, T. “Opening of an Accessible Microporosity in an Otherwise Nonporous Metal-Organic Framework by Polymeric Guests” *J. Am. Chem. Soc.* **2017**, *139*, 7886-7892.
- 5 – Nagarkar, S.S.; Horike, S.; Itakura, T.; Le Ouay, B.; Demessence, A.; Tsujimoto, M.; Kitagawa, S. “Enhanced and Optically Switchable Proton Conductivity in a Melting Coordination Polymer Crystal” *Angew. Chem. Int. Ed.* **2017**, *56*, 4976-4981.
- 6 – Kitao, T.; MacLean, M.; Le Ouay, B.; Sasaki, Y.; Tsujimoto, M.; Kitagawa, S.; Uemura, T. “Preparation of Polythiophene Microrods with Ordered Chains Alignment using Nanoporous Coordination Templates” *Polym. Chem.* **2017**, *8*, 5077-5081.
- 7 – Ertem, E.; Gutt, B.; Zuber, F.; Allegri, S.; Le Ouay, B.; mefti, S.; Formentin, K.; Stellacci, F.; Ren, Q. “Core-Shell Silver Nanoparticles in Endodontic Disinfection Solutions Enable Long-Term Antimicrobial Effects on Oral Biofilms” *ACS Appl. Mater. Interf.* **2017**, *9*, 34762-34772.

- 8 – Zeiri, O.; Raula, M.; Le Ouay, B.; Stellacci, F.; Weinstock, I. “Host-Guest Chemistry with Water-soluble Gold Nanoparticles Supra-spheres” *Nat. Nanotech.* **2017**, *12*, 170-176.
- 9 – Le Ouay, B.; Boudot, M.; Kitao, T.; Yanagida, T.; Kitagawa, S.; Uemura, T. “Nanostructuring of PEDOT in Porous Coordination Polymers for Tunable Porosity and Conductivity” *J. Am. Chem. Soc.* **2016**, *138*, 10088-10091.
- 10 – Le Ouay, B.; Guldin, S.; Luo, Z.; Allegri, S.; Stellacci, F. “Freestanding Ultrathin Nanoparticle Membranes Assembled at Transient Liquid-Liquid Interfaces” *Adv. Mater. Interf.* **2016**, *3*, 1600191.
- 11 – Le Ouay, B.; Stellacci, F. “Antibacterial Activity of Silver Nanoparticles: A Surface Science Insight” *Nano Today* **2015**, *10*, 339-354.
- 12 – Bouadbalaoui, L.; Le Ouay, B.; Coradin, T.; Laberty-Robert, C. “Evaluation of Hydrophilized Graphite Felt for Electrochemical Heavy Metals Detection” *Int. J. Electrochem.* **2015**, 890425.
- 13 – Le Ouay, B.; Coradin, T.; Laberty-Robert, C. “Mass Transport Properties of Silicified Graphite Felt Electrodes” *J. Phys. Chem. C* **2013**, *10*, 339-354.
- 14 – Le Ouay, B.; Coradin, T.; Laberty-Robert, C. “Silica-Carbon Hydrogels as Cyto-compatible Bioelectrodes” *J. Mater. Chem. B* **2013**, *1*, 606-609.
- 15 – Le Ouay, B.; Lau-Truong, S.; Flahaut, E.; Aubard, J.; Coradin, T.; Laberty-Robert, C. “DWCNT-doped Silica Gels Exhibiting both Ionic and Electronic Conductivity” *J. Phys. Chem. C* **2012**, *116*, 11306-11314.
- 16 – Wragg, D.S.; Le Ouay, B.; Beale, A.; O’Brien, M.; Slawin, A.; Warren, J.; Prior, T.; Morris, R.E. “Ionothermal Synthesis and Crystal Structures of Metal Phosphate Chains” *J. Solid State Chem.* **2010**, *183*, 1625-1631.
- 17 – Devic, T.; Horcajada, P.; Serre, C.; Salles, F.; Maurin, G.; Moulin, B.; Heurtaux, D.; Clet, G.; Vimont, A.; Greneche, J.M.; Le Ouay, B.; Moreau, F.; Magnier, E.; Filinchik, Y.; Marrot, J.; Lavalley, J.C.; Daturi, M.; Ferey, G. “Functionalization in Flexible Porous Solids: Effects on the Pore Opening and the Host-Guest Interactions” *J. Am. Chem. Soc.* **2010**, *132*, 1127-1136.
- 18 – Wragg, D.S.; Byrne, P.; Gariat, G.; Le Ouay, B.; Harrison, A.; Whittaker, A.; Morris, R.E. “In situ Comparison of Ionothermal Kinetics Under Microwave and Conventional Heating” *J. Phys. Chem. C* **2009**, *113*, 20553-20558.

Patent

US9549878B2: Le Ouay, B.; Stellacci, F.; Conde, J.; Mefti, S. "Nanoparticle-Containing irrigation solution for endodontic" **2015** *Granted*

Teaching Experience

Lecture

Materials Chemistry and Energy	2012
<i>Course on Microbial Fuel Cells. Participated as external speaker.</i>	
Undergraduate Students, Technical University of Sèvres. Total: 4 h	

Tutored classes

Mathematical Analysis	2014
Undergraduate Students (1 st year), EPFL. Total: 24 h	

Chemistry and Society	2012
Undergraduate Students (1 st year), Univ. Paris 6. Total: 12 h	

Materials and Energy	2011
Undergraduate Students (3 rd year), Univ. Paris 6. Total: 24 h	

Laboratory classes

Chemistry and Society	2012
Undergraduate Students (1 st year), Univ. Paris 6. Total: 8 h	

Materials Chemistry	2011
Undergraduate Students (3 rd year), Univ. Paris 6. Total: 36 h	

Hybrid Materials	2011
Graduate Students (Master 1), Univ. Paris 6. Total: 36 h	

General Chemistry	2011
Distance-Learning Undergraduate Students (1 st year), Univ. Paris 6. Total: 32 h	

Conference and Symposia Presentations

International Conferences and Symposia

3 rd European MOF Conference, Paris, France <i>Poster presentation</i>	2019
6 th International Conference on MOFs, Auckland, New Zealand <i>Oral presentation</i>	2018
43 rd International Conference on Coordination Chemistry, Sendai, Japan <i>Oral presentation</i>	2018
2 nd European MOF Conference, Delft, The Netherlands <i>Oral presentation</i>	2017
2012 Spring Meeting of the Materials Research Society. San Francisco, CA, USA <i>Oral presentation</i>	2012
4 th International Meeting of the Institute of Metals in Biology, Autrans, France <i>Oral and poster presentations</i>	2010

National and Local Conferences and Symposia

68 th Symposium on Macromolecules, Fukui, Japan <i>Oral Presentation</i>	2019
69 th Conference of the Japanese Society of Coordination Chemistry, Sendai, Japan <i>Oral Presentation</i>	2019
68 th Meeting of the Society of Polymer Sciences of Japan, Osaka, Japan <i>Oral Presentation</i>	2019
99 th Meeting of the Chemical Society of Japan, Kobe, Japan <i>Oral Presentation</i>	2019
1 st Conference on Polymers in Kanto, Tokyo, Japan <i>Oral Presentation; Award for best presentation</i>	2018
8 th Conference of the Chemical Society of Japan (CSJ-FESTA), Tokyo, Japan <i>Oral Presentation, on my experience as a researcher in Japan</i>	2018
67 th Symposium on Macromolecules, Sapporo, Japan <i>Oral Presentation</i>	2018
68 th Conference of the Japanese Society of Coordination Chemistry, Sendai, Japan <i>Oral Presentation</i>	2018
67 th Meeting of the Society of Polymer Sciences of Japan, Nagoya, Japan <i>Oral Presentation</i>	2018
98 th Meeting of the Chemical Society of Japan, Chiba, Japan <i>Oral Presentation</i>	2018
ACCEL National Project on MOFs: Annual Meeting, Kyoto, Japan <i>Poster Presentation</i>	2017
66 th Symposium on Macromolecules, Matsuyama, Japan <i>Oral Presentation</i>	2017

67 th Conference of the Japanese Society of Coordination Chemistry, Sapporo, Japan <i>Oral Presentation</i>	2017
66 th Meeting of the Society of Polymer Sciences of Japan, Chiba, Japan <i>Oral Presentation</i>	2017
97 th Meeting of the Chemical Society of Japan, Yokohama, Japan <i>Oral Presentation</i>	2017
65 th Symposium on Macromolecules, Kanagawa, Japan <i>Oral Presentation</i>	2016
66 th Conference of the Japanese Society of Coordination Chemistry, Fukuoka, Japan <i>Oral Presentation</i>	2016
65 th Meeting of the Society of Polymer Sciences of Japan, Kobe, Japan <i>Poster Presentation</i>	2016
96 th Meeting of the Chemical Society of Japan, Kyoto, Japan <i>Oral Presentation</i>	2016
Meeting of the Commission for Technology and Information, Bern, Switzerland <i>Poster Presentation</i>	2014
Conference of the Swiss Society of Coordination Chemistry, Lausanne, Switzerland <i>Poster Presentation</i>	2014
Meeting of the Doctoral School ED397, Paris, France <i>Oral Presentation, Award for Best Presentation</i>	2011

Outreach Activities

University of Tokyo, Kashiwa Campus festival <i>Animated a stand on Coordination Chemistry, with the development of a Prussian blue ink.</i>	2018
EPFL, High School Student Visits <i>Demonstration of the lab's activity, and notably of properties of colloidal systems.</i>	2013-2015
Non-profit association: Fête le savoir <i>This association's goal is to promote scientific events, in Paris suburb. I animated workshops on dye-sensitized fuel-cells, for Junior High School students</i>	2010
Non-profit association: Chercheurs Associes et Doctorants de Collège de France <i>Member of the direction committee. The association's goal is to federate young researchers from the Collège de France. Natural sciences and humanities were represented. While in this association, I helped organizing of the following events:</i>	2009-2012
Collège de France: Science festival <i>Each event included a dozen of booths, presented by Graduate students and PhD. In addition to the general organization, I prepared specific stands, on Hydrogen Energy and on Complex Fluids.</i>	Once per year - 2009-2012

Collège de France: Multidisciplinary seminars

2012

Young researchers presented their results to other members of the association. The presentations included chemistry, biology, history, legal study and literature.

Collège de France: Symposium on Energy

2011

In association with the main institution, we contributed to the organization of an international symposium on Energy, open to the public. Researchers with international recognition were invited to speak.