

Polymeric Materials

Research Engineer

Positions and Research experiences

- Oct. 2016 - Present** **Polymers, Research Engineer** at Chaire AgroBiotechnologies Industrielles (ABI) – AgroParisTech, Pomacle, France
- Project management
 - Development of new biobased polymeric materials and composites
 - Développement of new biobased plasticizers and additives for polymers
 - Referent in TGA and DSC
- Oct. 2014- Sep. 2016** **Polymers, Postdoctoral Researcher** at Chaire ABI –AgroParisTech, Pomacle, France
- Development of composites reinforced with natural fibers (FEDERATIF project)
- July 2012- Dec. 2013** **Polymers, Postdoctoral Researcher** at Ingénierie des Systèmes Polymères (ISP/UMET CNRS-UMR 8207) and École Nationale Supérieure de Chimie de Lille (ENSCL), Lille, France
- Upscaling of a reactive extrusion process of stereocomplexed poly-L,D-lactide for industrial applications (NANOLAC II project)
- Oct. 2008- Sep. 2011** **Polymers, PhD. Student** Ingénierie des Systèmes Polymères (ISP/UMET CNRS-UMR 8207) and École Nationale Supérieure de Chimie de Lille (ENSCL), Lille, France
- Reactive extrusion of flame-retarded stereocomplexed poly-L,D-lactide for textile applications at a laboratory scale (NANOLAC project)
- Sep. 2007 – June 2008** **Placement** Ingénierie des Systèmes Polymères (ISP/UMET CNRS-UMR 8207) and École Nationale Supérieure de Chimie de Lille (ENSCL), Lille, France
- Elaboration and characterization of polycarbonate and polymethylmetacrylate nano-filled blends for transport applications (POCANA project)
- June – Aug. 2007** **Placement** Ingénierie des Systèmes Polymères (ISP/UMET CNRS-UMR 8207) and École Nationale Supérieure de Chimie de Lille (ENSCL), Lille, France
- Fonctionnalization and characterization of carbon nanotubes used as nanofillers in flame retardancy of polylactides (MABIOLAC project)
- June – Aug. 2007** **Placement** Maison de la Recherche en Environnement Industriel (MREI), Dunkerque, France
- Synthesis and characterization of materials (metal oxides and hydrotalcites) used in environmental catalysis for oxidation of volatil organic compounds

Education

2008 – 2011 Ph.D (with honours) "Molecules and condensed matter", Université des Sciences et Technologies de Lille (USTL), Lille, France.

2006 – 2008 Master Degree "Materials: Process, Development, Innovation, Research", Université des Sciences et Technologies de Lille, Lille, France.

2004 – 2006 Bachelor Degree "Physics and Chemistry", Université du Littoral Côte d'Opale (ULCO), Dunkerque, France.

2003 – 2004 Classe préparatoire aux grandes écoles, speciality Physics and Chemistry, Lycée Jean Bart, Dunkerque, France

2002 – 2003 Baccalauréat général S, option Physique-Chimie, mention Assez-Bien, Lycée Jean Bart, Dunkerque, France

Scientific production

Publications:

[10] A. Gallos*, G. Paës, D. Legland, J. Beaugrand, F. Allais. **A microstructural and a chemical approach to highlight how a simple methyl group affects the mechanical properties of a natural fibers composite**. ACS Sustainable Chemistry & Engineering 5/11: 10352-10360, 2017

[9] A. Gallos*, G. Paës, F. Allais, J. Beaugrand. **Lignocellulosic fibers: A critical review of the extrusion process for enhancement of the properties of natural fiber composites**. RSC Advances 7: 34638, 2017

[8] A. Gallos*, G. Paës, D. Legland, F. Allais, J. Beaugrand. **Exploring the microstructure of natural fibre composites by confocal Raman imaging and image analysis**. Composite Part A: Applied Science and Manufacturing 94: 32-40, 2017

[7] G. Fontaine*, A. Gallos, S. Bourbigot. **Role of Montmorillonite for enhancing fire retardancy of intumescent PLA**. Fire Safety Science. 11 : 808-820, 2014

[6] A. Gallos*, G. Fontaine, S. Bourbigot. **Influence of MWNT and α -tropolone on thermal stability and cristallinity behavior of stereocomplexed poly-L,D-lactides**. Industrial & Engineering Chemistry Research. 53(22) : 9377-9382, 2014

[5] A. Gallos, G. Fontaine, S. Bourbigot*. **Reactive extrusion of stereocomplexed poly-L,D-lactide: processing, characterization and properties**. Macromolecular Materials and Engineering 298 : 1016-1023, 2013

[4] A. Gallos, G. Fontaine, S. Bourbigot*. **Reactive extrusion of intumescent stereocomplexed poly-L,D-lactide: characterization and reaction to fire**. Polymers for Advanced Technologies 24(1) : 130-133, 2013

[3] S. Bourbigot*, G. Fontaine, A. Gallos, S. Bellayer. **Reactive extrusion of PLA and PLA/Carbon nanotubes nanocomposites: processing, characterization and flame retardancy**. *Polymers for Advanced Technologies* 22 : 30-37, 2011

[2] M. Murariu*, A-L. Dechief, L. Bonnaud, Y. Paint, A. Gallos, G. Fontaine, S. Bourbigot, P. Dubois. **The production and properties of polylactide composites filled with expanded graphite**. *Polymer Degradation and Stability* 95(5) : 889-900, 2010

[1] S. Bourbigot*, G. Fontaine, A. Gallos, C. Gérard, S. Bellayer. **Functionnalized-carbon multiwall nanotubes as Flame Retardant for Polylactid Acid**. Published in "Fire and Polymers V", by C.A. Wilkie, A.B. Morgan and G.L. Nelson at ACS : 25-34, 2009

Oral Presentations:

2017 "How a single methyl group drastically affect the microstructure of an injected biocomposite reinforced with natural fibers ?", 6th World Congress on Biopolymers, 7th-9th September, Paris (France)

2017 "How can a single methyl group drastically affect the mechanical properties of a biocomposite: a microstructural & a chemical approach", The International Symposium on Green Chemistry, 16th-19th May, La Rochelle (France)

2017 "How can a single methyl group drastically modify the microstructure of a biocomposite ?", 253rd ACS National Meeting & Exposition, 2nd-6th April, San Francisco (USA)

2016 "Influence of the chemical structure of ferulic acid derivatives on the mechanical properties of biocomposites by confocal Raman imaging", 252nd ACS National Meeting & Exposition, 21st-25th Philadelphia (USA)

2016 "Chemo-enzymatic synthesis and polymerizations of bio-based bisphenols derived from lignin: an acces to novel 100% renewable antioxidants and alternating aromatic/aliphatic polymers", 32nd International Conference of the Polymer Processing Society, 25th-29th July, Lyon (France)

2016 "Influence of the chemical structure of ferulic acid derivatives on the aspect ratio of hemp fibres and on the mechanical properties of biocomposites by confocal Raman imaging", 32nd International Conference of the Polymer Processing Society, 25th-29th July, Lyon (France)

2016 "Ferulic acid derivatives for pretreatment of lignocellulosic fibres prior extrusion", Exploring Lignocellulosic Biomass, 23rd-24th June, Reims (France)

2016 " L'acide férulique et ses dérivés pour le traitement avancé de fibres lignocellulosiques avant extrusion pour la préparation de matériaux composites biosourcés", FARE seminar, 2nd May, Reims (France)

2016 "Corrélations entre les propriétés mécaniques et la répartition des fibres au sein d'un biocomposite par imagerie par microscopie confocale à spectroscopie Raman", Journées Jeunes Chercheurs de la SFR Condorcet, 20th January, Reims (France)

2016 "Correlations between mechanical properties and fibres dispersion in a biobased composite using confocal Raman imaging", scientific workshop "Fibre Quality - MultiHemp", 18th January, Lille (France)

2015 "Prétraitement de fibres lignocellulosiques par des synthons bio-sourcés pour des applications composites thermoplastiques : Apport de la cartographie topo-chimique par Microscopie Confocale à Spectroscopie Raman", XXI^e Journées Scientifiques du Groupement Français de Spectroscopie Vibrationnelle (GFSV), 17th - 19th June, Reims (France)

2015 "Prétraitement de fibres lignocellulosiques par des synthons bio-sourcés pour des applications composites thermoplastiques : Apport de la cartographie topo-chimique par Microscopie Confocale à Spectroscopie Raman", scientific workshop "Synthons et Matériaux Biosourcés SYMBIOSE", 8th - 10th April, Nantes (France)

2012 "Flame retardancy of stereocomplex PLA", BASF seminar, 18th October, Ludwigshafen (Germany)

2011 "Reactive extrusion of PLLA/PDLA stereocomplexes nanocomposites: Processing, characterization and properties", XIII^e congrès de la Société Française de Génie des Procédés (SFGP), 29th November to 1st December, Lille (France)

2009 "Fire reaction study of an intumescent polylactide", 2^e Journée des Jeunes Polyméristes du Nord (JPN), 2nd December, Lille (France)

Posters:

2017 "How ferulic acid can be turned into a biobased Non-Isocyanate PolyUrethane ?", 6th World Congress on Biopolymers, 7th-9th September, Paris (France)

2017 "How can a single methyl group modify the microstructure of a composite reinforced with natural fibers and affect its mechanical properties ?", Les Journées Condorcet, 8-9 June, Lille (France)

2016 "Quantification of the microstructure of natural fibre composite by Confocal Raman Imaging and image analysis", 6th Conference in Spectral Imaging, 3rd-6th July, Chamonix (France)

2015 "correlations between mechanical properties and fibres dispersion in a biobased composite using Confocal Raman Imaging", 5th International Conference on Biobased and Biodegradable Polymers, 6th - 9th October, San Sebastian (Spain)

2015 "Ferulic acid and derivatives for advanced treatment of lignocellulosic fibres before extrusion process", scientific workshop "composites biosourcés", 5th February, Nice - Sophia Antipolis (France)

2013 "Reactive extrusion of intumescent stereocomplexed poly-(L,D)-lactide", 14th Fire Retardancy and Protection of Materials (FRPM), 30th June - 4th July, Lille (France)

2013 "Fire toxicity of a (nano)composite flame retarded polylactide", 5th International Seminar on Modern Polymeric Materials for Environmental Applications (MPM), 15th - 17h May, Krakow (Poland)

Supervision & Teaching

May - June 2016 **B. Sc student from the Indian Institute of Technology of Roorkee (India)**
The student was trained for chemo-enzymatic synthesis, extrusion and injection process

March - Sep. 2017 **M. Sc Student from the University of Lorraine (France)**
The student performed chemo-enzymatic synthesis, extrusion and injection process to investigate the plasticizing and antioxidant effects of additives blended in polyesters and polyolefins matrixes

2009 - 2011 **Monitor**
In charge of a section of undergraduate B. Sc students for practical in chemical analysis

Language

French : Native Language

English : Advanced

German : Intermediate