



► Aurélie Taguet

Fonction : Maître Assistant des Ecoles des Mines.....
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Diploma

- 2018 « **Habilitation à Diriger des Recherches** », Université de Montpellier
- 2005 **PhD** in material chemistry – Université de Montpellier-2
European program ENK5-2002-00669. PhD supervisor: Pr. B. Ameduri.
- 2002 **Postgraduate degree** in Material Science – ENSEEG (Phelma), INP Grenoble
- 2002 **Master degree** (engineer) in Material Science – ENSEEG (Phelma), INP Grenoble

Experiences

- Current **Associate professor** – C2MA, IMT Mines Ales, FRANCE
How to tailor mechanical, thermal and fire properties in ternary nanocomposites by selectively dispersing nanoparticles?
- 2008-2011 **Research engineer** - C2MA, IMT Mines Ales, FRANCE
Enhancement of mechanical and fire properties of (bio)composites
- 2006-2008 **Research associate / Postdoc** – Cerestech (spin off company in Ecole Polytechnique de Montréal, Canada) – Prof. B. Favis
Processing and characterization of bioplastic blends based on polyethylene and thermoplastic starch (application: films and containers); interfacial modification.
- 2002-2005 **PhD** – IAM, Institut Charles Gerhardt Montpellier
Elaboration of proton exchange membranes for fuel cells: Grafting of fluorinated polymers.

Publications

- 32/ A. Taguet, “ Rheological Characterization of polymer blends”(Chapter 24)”; In: “Compatibilization of Polymer Blends: Micro and Nano Scale Phase Morphologies, Interphase Characterisation and Ultimate Properties”, S. Thomas & A.R. Ajitha (eds), Elsevier S&T Books publisher, **expected in 2019**.
- 31/ R. Sonnier, A. Taguet, L. Ferry, J.-M. Lopez-Cuesta, Towards Bio-based Flame Retardant Polymers, P. Navard (ed), Springer, **2018**.
- 30/ R. Sonnier, A. Taguet, S. Rouif, Modification of polymer blends by e-beam and γ -radiation, In: Functional Polymer Blends: Synthesis, Properties and Performance, Editor: Dr. Vikas Mittal, Publisher: Taylor and Francis (CRC Press), USA. **2012**.
- 29/ M. Sahnoune, M. Kaci*, A. Taguet, J.-M. Lopez-Cuesta, K. Delbe, W. W. Focke, S. Mouffok, S. Abdi, Tribological and Mechanical Properties of Polyamide-11/Halloysite Nanotubes Nanocomposites, J Polym Eng, DOI: 10.1515/polyeng-2018-0131.
- 28/ M. Sahnoune, M. Kaci, A. Taguet*, B. Otazaghine, J.-M. Lopez-Cuesta, Fire Retardancy Effect of Phosphorus-Modified Halloysite on Polyamide-11 Nanocomposites, submitted to Polymer for Advanced Technologies. *In press*
- 27/ M. Sahnoune, A. Taguet*, B. Otazaghine, M. Kaci and J.-M. Lopez-Cuesta, Effects of functionalized halloysite on morphology and properties of polyamide-11/SEBS-g-MA blends, Eur Polym J, **2017**, 90, 418-430. DOI: 10.1016/j.eurpolymj.2017.03.008
- 26/ M. Sahnoune, A. Taguet, B. Otazaghine*, M. Kaci and J.-M. Lopez-Cuesta, Inner surfacemodification of halloysite nanotubes and its influence on morphology and thermal properties of polystyrene/polyamide-11 blends, Polym Int, **2017**, 66, 300-312. DOI: 10.1002/pi.5266
- 25/ A. S. Caro*, T. Parpaite, B. Otazaghine, A. Taguet, and J. M. Lopez-Cuesta, Viscoelastic properties of polystyrene/polyamide-6 blend compatibilized with silica/polystyrene Janus hybrid nanoparticles, J Rheol, **2017**, 61, 305-310. DOI: 10.1122/1.4975334
- 24/ A. Viretto, A. Taguet*, R. Sonnier, Selective dispersion of nanoplatelets of MDH in a HDPE/PBT binary blend: Effect on flame retardancy, Polym Deg Stab, **2016**, 126, 107-116. DOI: 10.1016/j.polymdegradstab.2016.01.021
- 23/ T. Parpaite, B. Otazaghine*, A.S. Caro, A. Taguet, R. Sonnier, J.M. Lopez-Cuesta, Janus hybrid silica/polymer nanoparticles as effective compatibilizing agents for polystyrene/polyamide-6 melted blends, Polymer, **2016**, 90, 34-44. DOI: 10.1016/j.polymer.2016.02.044
- 22/ A. Viretto, R. Sonnier*, A. Taguet, B. Otazaghine, L. Ferry, J.-M. Lopez-Cuesta and C. Lagrève, Thermal degradation of polyesters filled with magnesium dihydroxide and magnesium oxide, Fire & Materials, **2016**, 40 , 445-463. DOI: 10.1002/fam.2299
- 21/ C. Beauger*, G. Laine, A. Burr, B. Otazaghine, A. Taguet, Improvement of Nafion®-sepiolite composite membranes for PEMFC with sulfo-fluorinated sepiolite, J. Memb. Sci., **2015**, 495, 392–403. DOI: 10.1016/j.memsci.2015.08.014
- 20/ L. Ferry*, G. Dorez, A. Taguet, B. Otazaghine, J.M. Lopez-Cuesta, Chemical modification of lignin

by phosphorus molecules to improve the fire behavior of polybutylene succinate, *Polymer Degradation & Stability*, **2015**, 113, 135-143. DOI: 10.1016/j.polyimdegstab.2014.12.015

19/ Mélissa Poncet-Malige, Stéphane Corn*, Aurélie Taguet, José-Marie Lopez-Cuesta, A quantitative study of the morphology of montmorillonite filled thermosets based on a tailor made homogenisation model, *Composites : Part A*, **2015**, 77, 67-74. DOI: 10.1016/j.compositesa.2015.05.036

18/ G. Dorez, B. Otazaghine*, A. Taguet, L. Ferry, J.M. Lopez-Cuesta, Use of Py-GC/MS and PCFC to characterize the surface modification of flax fibres, *J. Anal. Appl. Pyr.*, **2014**, 105, 122-130. DOI: 10.1016/j.jaap.2013.10.011

17/ G. Dorez, B. Otazaghine*, A. Taguet, L. Ferry, J.M. Lopez-Cuesta, Improvement of the fire behavior of poly(1,4-butanediol succinate)/flax biocomposites by fiber surface modification with phosphorus compounds: molecular versus macromolecular strategy, *Polym. Int.*, **2014**, 63, 1665-1673. DOI: 10.1002/pi.4688

16/ G. Dorez, A. Taguet, L. Ferry*, J.M. Lopez-Cuesta, Effect of cellulose, hemicellulose and lignin contents on pyrolysis and combustion of natural fibers, *J. Anal. Appl. Pyr.*, **2014**, 107, 323-331. DOI: 10.1016/j.jaap.2014.03.017

15/ G. Dorez, A. Taguet, L. Ferry*, J.M. Lopez-Cuesta, Phosphorous compounds as flame retardants for polybutylenesuccinate/flax biocomposite: Additive versus reactive route, *Polym. Deg. Stab.*, **2014**, 102, 152-159. DOI: 10.1016/j.polyimdegstab.2014.01.018

14/ A.Taguet*, P. Cassagnau, J.-M. Lopez-Cuesta, Structuration, selective dispersion and compatibilizing effect of (nano)fillers in polymer blends, *Prog. Polym. Sci.*, **2014**, 39, 1526-1563. DOI: 10.1016/j.progpolymsci.2014.04.002

13/ T. Parpaite, B. Otazaghine*, A. Taguet, R. Sonnier, A.S. Caro, J.M. Lopez-Cuesta, Incorporation of modified Stöber silica nanoparticles in polystyrene/polyamide-6 blends: Coalescence inhibition and modification of the thermal degradation via controlled dispersion at the interface, *Polymer*, **2014**, 55, 2704-2715. DOI: 10.1016/j.polymer.2014.04.016

12/ A. Taguet*, M. N. Bureau, M. A. Huneault, B. D. Favis, Toughening mechanisms in interfacially modified HDPE/thermoplastic starch blends, *Carbohydrate Polymers*, **2014**, 114, 222-229. DOI: 10.1016/j.carbpol.2014.07.073

11/ I. Zembouai, S. Bruzaud*, M. Kaci, A. Benhamida, Y.-M. Corre, Y. Grohens, A. Taguet, J.-M. Lopez-Cuesta, Poly(3-Hydroxybutyrate-co-3-Hydroxyvalerate)/Polylactide Blends: Thermal Stability, Flammability and Thermo-Mechanical Behavior, *J. Polym. Env.*, **2014**, 22, 131-139. DOI: 10.1007/s10924-013-0626-7

10/ C. Beauger*, G. Laine, A. Burr, B. Otazaghine, A. Taguet, A. Rigacci, Nafion-sepiolite composite membranes for improved proton exchange membrane fuel cell performance, *J. Memb. Sci.*, **2013**, 430, 167-179. DOI: 10.1016/j.memsci.2012.11.037

9/ G. Dorez, A. Taguet*, L. Ferry, J.M. Lopez-Cuesta, Thermal and fire behavior of natural fibers/PBS biocomposites, *Polym. Deg. Stab.*, **2013**, 98, 87-95. DOI: 10.1016/j.polyimdegstab.2012.10.026

8/ R. Sonnier*, A. Viretto, A. Taguet, J.M. Lopez-Cuesta, Influence of the morphology of the fire behavior of a polycarbonate/poly(butylene terephthalate) blend, *J. Appl. Polym. Sci.*, **2012**, 125, 3148-

3158. DOI: 10.1002/app.36480

7/ A. Taguet, M.A. Huneault, B. Favis*, Interface/morphology relationships in polymer blends with thermoplastic starch, *Polymer*, **2009**, 50, 5733-5743. DOI: 10.1016/j.polymer.2009.09.055

6/ A. Taguet, B. Ameduri*, B. Boutevin, Synthesis of Original para-Sulfonic Acid Aminoethylthioethylbenzenesulfonic by Telomerization, and Its Grafting onto Poly(VDF-co-HFP) Copolymers for Proton Exchange Membrane for Fuel Cell, *J. Polym. Sci. Part A: Polym. Chem.*, **2009**, 47, 121–136. DOI: 10.1002/pola.23129

5/ A. Taguet, L. Sauguet, B. Ameduri*, Fluorinated Model Cotelomers based on Vinylidene Fluoride and Hexafluoropropene: Synthesis, Dehydrofluorination and Grafting by Amines Containing an Aromatic Ring, *J. Fluor. Chem.*, **2007**, 128(6), 619-630. DOI: 10.1016/j.jfluchem.2007.02.005

4/ A. Taguet, B. Ameduri*, B. Boutevin, Grafting of Commercially Available Amines Bearing Aromatic Ring onto Poly(VDF-co-HFP) Copolymers, *J. Polym. Sci., Part A*, **2006**, 44(6), 1855-1868. DOI: 10.1002/pola.21295

3/ A. Taguet, B. Ameduri*, A. Dufresne, Crosslinking and Characterization of Commercially Available Poly(VDF-co-HFP) Copolymers with Trimethylhexanediamine, *Eur. Polymer J.*, **2006**, 42(10), 2549-2561. DOI: 10.1016/j.eurpolymj.2006.04.012

2/ A. Taguet, B. Ameduri*, B. Boutevin, Grafting of 4-Hydroxybenzenesulfonic Acid onto Commercially Available Poly(VDF-co-HFP) Copolymers for the Preparation of Membranes, *Fuel Cells*, **2006**, 6(5), 331-339. DOI: 10.1002/fuce.200600006

1/ A. Taguet, B. Ameduri, B*. Boutevin, Crosslinking of Vinylidene Fluoride Containing Fluoropolymers, *Adv. Polym. Sci.*, **2005**, 184, 127-211. DOI : 10.1007/b136245

Research areas

- physical chemistry of polymers
- polymer blends
- nanocomposites
- mechanical, thermal and fire properties

Summary

My experience and my research project is around the effect of the morphology of polymer systems on the mechanical, thermal and fire properties. The intrinsic parameters of the polymeric media (interfacial tension, viscosity, proportions, use of a compatibilizing agent) as well as the process parameters (temperature, speed of the screws) can lead to different morphologies and properties. I studied the influence of the morphology of different blends (PE / TPS, PC / PBT, PHBV / PLA) on mechanical, thermal or fire properties. The addition of nanoparticles in these blends makes it possible to generate singular morphologies leading to a modification of these properties. I was able to show that by modifying an NPs (silica or nanotube of halloysite or kaolin) or by modifying the parameters of the process, it was possible to disperse them selectively in a blend and to vary the properties. I was able to set up a set of criteria to better understand the effect of materials and process parameters on localization and properties. This point still needs to be deepened. In parallel, I worked on the dispersion of NPs (montmorillonite, sepiolite, nanodiamonds and halloysite) in polymer matrices (thermoplastic or thermosetting) as well as on the modification of natural fibers by irradiation to improve the interface with a PE matrix.

