

Juan Pablo Hinestrosa

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Education

Clemson University, Clemson, SC,	Chemical Engineering	Ph.D., 2010
Universidad del Valle, Cali, Colombia	Chemical Engineering	B.S. (1 st in Class) 2004

Professional Experience

7/2011 - present	Postdoctoral Research Associate, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory.
5/2010 – 6/2011	Postdoctoral Fellow, École Polytechnique Fédérale de Lausanne, Switzerland.
2/2008-5/2010	Visiting Scientist, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory.
8/2005-5/2010	Graduate Research Assistant, Department of Chemical and Biomolecular Engineering, Clemson University.
09-12/ 2004	Special Projects Assistant Engineer, Quimica Basica Colombiana S.A., Colombia.

Honors and Awards

2010	Excellence in Graduate Polymer Research by the Polymer Chemistry division of the American Chemical Society (ACS).
2009	Scholarship for ACS Summer School in Green Chemistry and Sustainability.
2008	Scholarship for 10 th National School in Neutron and X-Ray Scattering.
2008	Scholarship for 14 th Summer School in Fundamentals of Neutron Scattering.

Research Interests

Polypeptide and Polypeptoid Brushes

We are exploring the intrinsic responsiveness, due to phase transitions, of polypeptides and polypeptoid brushes. By combining two or more peptide monomers, new properties and behavior can be accessed. Complex patterned layers of these nature-like materials are created by combining lithographic and vapor-phase polymerization techniques.

Characterization of Functional Polymer Architectures

We use scattering (neutron and light) and microscopy (atomic force and scanning electron) techniques to comprehend the effects of composition, architecture and environmental conditions in the behavior of precisely synthesized functional polymers. We have been able to find direct correlation between the property-structure relationships and the overall organization and performance of these soft materials.

Mimics of Biomineralization Processes

We use synthetic strategies such as layer-by-layer deposition to replicate the natural process of biosilification as an alternative to create hybrid organic-inorganic substrates. We also use pattern layers to direct the silification process and understand the 'size' limits of it.

Smart Coatings for Inorganic Substrates

We use bi- or tri- functional block copolymers to create smart coatings on inorganic substrates. For properly anchoring the material, epoxy-based polymers is use and in a block conformation an azlactone- or ethylene oxide- based polymer is used to modify responsiveness of the layer to external stimuli such as pH, temperature or solvent conditions.

Graduate and Postdoctoral Advisors

Graduate: Prof. Dr. S. Michael Kilbey, II (Clemson University)

Postdoctoral: Prof. Dr. Harm-Anton Klok (École Polytechnique Fédérale de Lausanne)

Dr. Jamie Messman (Oak Ridge National Laboratory)

Dr. Scott Retteret (Oak Ridge National Laboratory)

Publications

6. Schüwer, N.; Geue, T.; Hinestrosa, J.P.; Klok, H.-A. "Neutron Reflectivity Study on the Postpolymerization Modification of Poly (2-hydroxyethyl methacrylate) Brushes" *Macromolecules* **2011**, *44*, 6868.

5. Soto-Cantu, E.; Hinestrosa, J.P.; Lokitz, B.; Deodhar, C.; Messman, J.; Ankner, J.; Kilbey, S.M. "Versatility of Alkyne-Containing Poly (Glycidyl Methacrylate) Layers for Click Reactions" *Langmuir* **2011**, *27*, 5986.

4. He, L.; Hinestrosa, J.P.; Pickel, J.; Zhang, S.; Bucknall, D.; Kilbey, S.M.; Mays, J.; Hong, K "Fluorine-Containing Linear Triblock Terpolymers: Synthesis and Self-assembly in Solution" *J. Polym. Sci. Pol. Chem.* **2011**, *49*, 414.

3. Hinestrosa, J.P.; Alonzo, J.; Osa, M.; Kilbey, S. M. "Solution Behavior of Polyisoprene-Polystyrene Miktoarm Block Copolymers in a Selective Solvent for Polyisoprene" *Macromolecules* **2010**, *43*, 7294.

2. Hinestrosa, J.P.; Alonzo, J.; Mays, J.; Kilbey, S. M. "Role of Surface Reorganization on Preferential Adsorption of Macromolecular Ensembles at the Solid/Fluid Interface" *Macromolecules* **2009**, *42*, 7913.

1. Lokitz, B.S.; Messman, J.; Hinestrosa, J.P.; Alonzo, J.; Verduzco, R.; Osa, M.; Brown, R.; Ankner, J.; Kilbey, S. M. "Dilute Solution Properties and Surface Attachment of RAFT Polymerized 2-Vinyl-4,4-Dimethylazlactone (VDMA)" *Macromolecules* **2009**, *42*, 9018.

Manuscripts in preparation

- i. Alonzo, J.; Hinestrosa, J.P.; Mays, J.; Kilbey, S.M. "Kinetics of Preferential Adsorption of Amphiphilic Star Block Copolymers that Tether by their Corona Blocks at the Solid/Fluid Interface" to be submitted to *Soft Matter*.
- ii. Hinestrosa, J.P.; Uhrig, D.; Pickel, D.L.; Kilbey S.M. "Hydrodynamics of A_nB_n Heteroarm star Copolymers in a Selective and a Non-Selective Solvent" to be submitted to *Nanoscience*.