

Peter V. Bonnesen

R&D Staff
Macromolecular Nanomaterials Group
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Education

Lafayette College, Easton, PA	Chemistry	B.S. (ACS certified), 1983
University of California at Los Angeles	Inorganic Chemistry	Ph.D., 1989

Professional Experience:

2006-present	Research Staff, Macromolecular Nanomaterials Group, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory
1993-2013	Research Staff, Chemical Separations Group, Chemical Sciences Division, Oak Ridge National Laboratory
1991-1993	Postdoctoral Research Associate, University of California at Berkeley
1989-1991	Research Scientist, Specialty Industrial Polymers Division, Rohm and Haas Company, Spring House, PA

Professional and Synergistic Activities

2014-2015	Co-Guest Editor, <i>Molecules</i> (Special Issue - "Deuterated Molecules and Polymers for Neutron Studies")
2005-present	Editorial Board, <i>Solvent Extraction and Ion Exchange</i>
1983-present	Member: American Chemical Society

Honors and Awards

2013	DOE Secretary's Achievement Award (as member of Salt Waste Disposal Technologies Team) for "The Development and Implementation of a High-Level Salt Waste Processing Technology"
2004	R&D IR-100 Award, for "Highly Selective, Regenerable Perchlorate Treatment System"
2002	Battelle Technical Council Science & Technology Challenges Competition Winner
1999	Lockheed Martin Energy Research Corporation Valuable Invention Award
1999	Lockheed Martin Research Corporation Development Awards (2)
1994	Martin Marietta Energy Systems Technology Transfer Award
1984	Department of Chemistry Teaching Award, University of California at Los Angeles

Research Interests

- 1) Synthesizing, and investigating the properties of, deuterium-labelled molecules.
- 2) Synthesis of novel monomers and polymers
- 3) Nuclear Magnetic Resonance studies to probe molecular dynamics, and to elucidate reaction mechanisms

Selected Peer-Reviewed Publications (Author of more than 70 articles in refereed journals and books):

J. Wang, P. V. Bonnesen, E. Rangel, E. Vallejo, A. Sanchez-Castillo, H. J. Cleaves II, A. P. Baddorf, B. G. Sumpter, M. Pan, P. Maksymovych, and M. Fuentes-Cabrera, "Supramolecular polymerization of a prebiotic nucleoside provides insights into the creation of sequence-controlled polymers", *Nature Scientific Reports*, **2016**, article 18891.

J. Zhu, Y. Han, R. Kumar, Y. He, K. Hong, P. V. Bonnesen, B. G. Sumpter, S. C. Smith, G. S. Smith, I. N. Ivanov and C. Do, "Controlling Molecular Ordering in Solution-State Conjugated Polymers," *Nanoscale.*, **2015**, 7, 15134-15141.

H.-H. Zhang, P. V. Bonnesen, and K. Hong, "Palladium-catalyzed Br/D exchange of arenes: Selective deuterium incorporation with versatile functional group tolerance and high efficiency," *Org. Chem. Front.*, **2015**, 2, 1071-1075.

C. Deodhar, E. Soto-Cantu, D. Uhrig, P. Bonnesen, B. S. Lokitz, J. F. Ankner and S. M. Kilbey II, Hydration in Weak Polyelectrolyte Brushes," *ACS Macro Letters* **2013**, 2, 398-402

J. Yang, K. Hong, P. V. Bonnesen, Synthesis of *N*¹-tritylethane-1,1,2,2-*d*₄-1,2-diamine: a novel mono-protected C-deuterated ethylenediamine synthon," *J. Labelled Compd. Radiopharm.* **2012**, 55, 463-466.

R. Custelcean, P. V. Bonnesen, B. D. Roach, and N. C. Duncan, "Ion-Pair Triple Helicates and Mesocates Self-Assembled from Ditopic 2,2'-bipyridine-bis(urea) ligands and Ni(II) and Fe(II) Sulfate Salts," *ChemComm* **2012**, 48, 7438-7440.

V. M. Prabhu, S. Kang, J. Sha, P. V. Bonnesen, S. Satija, W. Wu, and C. K. Ober, "Neutron Reflectivity Characterization of the Photoacid Reaction-Diffusion Latent and Developed Images of Molecular Resists for Extreme Ultraviolet Lithography," *Langmuir* **2012**, 28, 7665-7678.

R. Custelcean, P. V. Bonnesen, N. C. Duncan, X. Zhang, L. A. Watson, G. Van Berkel, W. B. Parson, and B. P. Hay, "Urea-Functionalized M₄L₆ Cage Receptors: Self-Assembly, Dynamics, and Anion Recognition in Aqueous Solutions," *J. Am. Chem. Soc.* **2012**, 134, 8525-8534.

J. Yang, K. Hong, and P. V. Bonnesen, "A method for preparing sodium acrylate-*d*₃, a useful and stable precursor for deuterated acrylic monomers," *J. Labelled Compd. Radiopharm* **2011**, 54, 743-748.

V. M. Prabhu, S. Kang, R. J. Kline, D. M. DeLongchamp, D. A. Fischer, W. Wu, S. K. Satija, P. V. Bonnesen, J. Sha, C. K. Ober. "Characterization of the non-uniform reaction in chemically-amplified calix[4]resorcinarene molecular resist thin films," *Aust. J. Chem.*, **2011**, 64, 1065-1073.

J. Sha, J.-K. Lee, S. Kang, V. M. Prabhu, C. L. Soles, P. V. Bonnesen, and C. K. Ober, "Architectural Effects on Acid Reaction-Diffusion Kinetics in Molecular Glass Photoresists," *Chem. Mater.* **2010**, 22, 3093-3098.

F. Loustau-Chartez, R. M. Robeson, R. Custelcean, R. A. Sachleben, and P. V. Bonnesen, "2,2,3,3,11,11,12,12-Octamethyl-1,4,7,10,13-Pentaoxacyclohexadecane: Improved Synthesis and Crystal Structure with NaSCN," *Tetrahedron Lett.* **2009**, 50, 2936-2938.

R. Custelcean, J. Bosano, P. V. Bonnesen, V. Kertesz, and B. P. Hay, "Computer-Aided Design of a Sulfate-Encapsulating Receptor," *Angew. Chem. Int. Ed.* **2009**, 48, 4025-4029.

R. Custelcean, N. L. Engle, and P. V. Bonnesen, "Crystalline Hydrogen-Bonded Nanocolumns of Cyclic Thiourea Octamers," *Cryst. Eng. Comm.* **2007**, 9, 452-455.

Selected Issued Patents (of 13 granted)

Jun Yang, Peter V. Bonnesen, and Kunlun Hong, "Methods for the Synthesis of Deuterated Acrylate Salts" U.S. Patent 8,829,238 B2, September 9, 2014.

K. Hong, J. Yang, and P. V. Bonnesen, "Methods for the Synthesis of Deuterated Vinyl Pyridine Monomers", U.S. Patent 8,658,802, February 25, 2014.

P. V. Bonnesen, B. A. Moyer, and R. A. Sachleben, "Fluoro-alcohol Phase Modifiers and Process for Cesium Solvent Extraction," U. S. Patent 6,566,561, May 20, 2003.

Graduate and Postdoctoral Advisors:

Graduate Advisor: William H. Hersh, Queens College of CUNY;

Postdoctoral Advisor: Kenneth N. Raymond, University of California at Berkeley

Total Postdocs Advised: 3