

Paschalis Alexandridis

Contact Info:

Department of Chemical and Biological Engineering (CBE)
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Education:

Ph.D. Chem.Eng. (1994), Massachusetts Institute of Technology (MIT), Cambridge, MA
M.S. Chem.Eng.Practice (1990), Massachusetts Institute of Technology, Cambridge, MA
Dipl.Eng. (Chem.Eng.) (1989), National Technical University (EMII), Athens, Greece

Professional Experience:

2009-present UB Distinguished Professor, Chemical and Biological Eng., University at Buffalo - SUNY
2020-present Adjunct Professor, Civil, Structural and Environmental Eng., University at Buffalo - SUNY
2008-11, 2013-16 Director of Graduate Studies, Chemical and Biological Eng., University at Buffalo - SUNY
2012-2014 Co-Director, Materials Science and Engineering Program, University at Buffalo - SUNY
2011-2013 Associate Dean for Research and Graduate Education (acting), SEAS, University at Buffalo
2003-2009 Professor, Dept. of Chemical and Biological Engineering, University at Buffalo - SUNY
1997-2003 Assistant & Associate Professor, Dept. of Chemical Eng., University at Buffalo - SUNY
1994-1997 Postdoctoral Fellow, Center for Chemistry and Chemical Eng., Lund University (Sweden)
Visiting Professor Advanced Transdermal Drug Delivery Systems Center, Kyushu University (Japan)
Visiting Scientist Max-Planck Society Fritz-Haber Institute (Germany), Tokyo University of Science (Japan)

Research Expertise:

Soft Matter, Complex Fluids, Interfacial Phenomena, Colloids, Formulations, Self-Assembly, Directed Assembly, Block Copolymers, Biopolymers, Surfactants, Water, Ionic Liquids, Nanomaterials, Particle Synthesis, Biomass Processing, Plastic Recycling, Product Design
Broader Impacts: Environment (water), Health (drug delivery), Energy (petroleum extraction)

Research Output & Impact:

2 books edited (*Amphiphilic Block Copolymers, Mesoscale Phenomena in Fluid Systems*)
>185 refereed articles in journals and books, >65 conference proceedings, 6 US patents
>200 invited talks in academia/industry/conferences, >450 papers in nat'l/int'l scientific mtgs
Citations: 15,100 (Web of Sci.), 20,800 (Google Scholar); "h" index: 66 (WoS), 73 (G) (1/2022)

Honors & Awards:

Fellow, Royal Society of Chemistry (RSC) (2020)
Fellow, American Institute of Chemical Engineers (AIChE) (2016)
Fellow, American Association for the Advancement of Science (AAAS) (2012)
Excellence in Graduate Student Mentoring Award (inaugural), University at Buffalo (2012)
SUNY Chancellor's Award for Excellence in Scholarship and Creative Activity (2011)
Jacob F. Schoellkopf Medal, American Chemical Society (ACS) (2010)
SUNY Chancellor's Award for Excellence in Teaching (2006)
Bodossaki Foundation Academic Prize in Applied Science (2005)
International Young Investigator Award, Sigma Xi Scientific Research Society (2002)
Institute Lecturer Award, Japan Research Institute of Material Technology (2001)
Faculty Early Career Development Award (CAREER), National Science Foundation (1999)
Dow Outstanding New Faculty Award, American Society for Engineering Education (1999)

Professional Activities:

Chair (2004-2007) and Vice-Chair (2001-2004), AIChE Area 1C: "Interfacial Phenomena"
Board Member, AIChE Nanoscale Science and Engineering Forum (NSEF), 2005-2009
Executive Committee Member, ACS Division of Colloid and Surface Chemistry, 2014-2016
Co-organizer, AIChE Meeting Sessions on "Self-Assembly in Solution" (1997-2002, 2010-21), "Biomolecules at Interfaces" (2006-2008), "Interfacial Phenom. in Ionic Liquids" (2010-2018); symposia on "Self-Assembly" (2002-04, 2016) and "Chem. of Colloidal Materials" (2010), ACS Colloid & Surf. Sci. Symp.; symposia on "PFAS Solution & Interfacial Phenom." (2020) and "Structure & Transport in Ionic Systems" (2020), ACS Nat'l Meeting
Journal Editor: *Curr. Opin. Colloid Interface Sci.* (2001-05), *J. Surf. Deterg.* (2013-14, 2018-) co-Editor-in-Chief, *Int. J. Mol. Sci.* (2019-), Editor-in-Chief, *J. Dispersion Sci. Tech.* (2021-)

University Service:

SUNY Graduate & Research Cmt., 2008-11; SUNY Programs & Awards Committee, 2018-21
UB Graduate School Exec. Cmt., 2010-16; Academic Planning & Assessment Cmt., 2014-21
Faculty Senate, 2005-09, 2012-18, 2019-23; FS Exec. Cmt.; President's Review Board for Tenure & Promotion, 2007-10; SEAS Faculty Personnel Cmt., 2004-07, 2010-11, 2019-22
Courses Developed: Product Design, Colloids & Surfaces, Polymer Eng., Petroleum Eng.

Self-assembly of amphiphiles / polymers: thermodynamics, structure, and dynamics

- GenX in water: Interactions and self-assembly. Kancharla, S.; Choudhary, A.; Davis, R.; Dong, D.; Bedrov, D.; Tsianou, M.; Alexandridis, P. *J. Hazard. Mater.* **2022**, *428*, 128137.
- Controlling the self-assembly of perfluorinated surfactants in aqueous environments. Dong, D.; Kancharla, S.; Hooper, J.; Tsianou, M.; Bedrov, D.; Alexandridis, P. *Phys. Chem. Chem. Phys.* **2021**, *23* (16), 10029-10039.
- Structure and composition of mixed micelles formed by nonionic block copolymers and ionic surfactants in water determined by SANS. Kancharla, S.; Bedrov, D.; Tsianou, M.; Alexandridis, P. *J. Colloid Int. Sci.* **2022**, *609*, 456-68.
- Self-assembly of amphiphilic block copolymers in ternary solvent mixtures: Lyotropic liquid crystalline phase behavior & structure. Sarkar, B.; Lakshmichand, J.; Alexandridis, P. *Macromol. Chem. Phys.* **2012**, *213* (23), 2514-28.
- Mean-field theory prediction of the phase behavior and structure of alkyl-propoxy-ethoxylate surfactants in water. Shusharina, N. P.; Balijepalli, S.; Gruenbauer, H. J. M.; Alexandridis, P. *Langmuir* **2003**, *19* (10), 4483-4492.

Nanostructured polymer systems of biological significance

- Well-defined homopolypeptides, copolypeptides and hybrids of poly(L-proline). Gkikas, M.; Iatrou, H.; Thomaidis, N.; Alexandridis, P.; Hadjichristidis, N. *Biomacromolecules* **2011**, *12* (6), 2396-2406.
- Solvent effects on polysaccharide conformation. Antoniou, E.; Buitrago, C. F.; Tsianou, M.; Alexandridis, P. *Carbohydrate Polymers* **2010**, *79* (2), 380-390.
- Application of fluorescence spectroscopy to quantify shear-induced protein conformation change. Themistou, E.; Singh, I.; Shang, C.; Balu-Iyer, S. V.; Alexandridis, P.; Neelamegham, S. *Biophys. J.* **2009**, *97* (9), 2567-2576.
- Utilizing temperature-sensitive association of Pluronic F127 with lipid bilayers to control liposome-cell adhesion. Chandaroy, P.; Sen, A.; Alexandridis, P.; Hui, S. W. *Biochim. Biophys. Acta - Biomembranes* **2002**, *1559* (1), 32-42.

Directed assembly: manipulation and organization of polymers or nanoparticles via external fields

- 3D direct writing fabrication of electrodes for electrochemical energy storage devices. Wei, M.; Zhang, F.; Wang, W.; Alexandridis, P.; Zhou, C.; Wu, G. *Journal of Power Sources* **2017**, *354*, 134-147.
- Nanoparticles in ionic liquids. He, Z.; Alexandridis, P. *Phys. Chem. Chem. Phys.* **2015**, *17* (28), 18238-18261.
- Using nonuniform electric fields to accelerate the transport of viruses to surfaces from media of physiological ionic strength. Docoslis, A.; ...; Israel, B. A.; Alexandridis, P.; Abbott, N. L. *Langmuir* **2007**, *23* (7), 3840-3848.
- Influence of shear on solvated amphiphilic block copolymers with lamellar morphology. Zipfel, J.; Berghausen, J.; Schmidt, G.; Lindner, P.; Alexandridis, P.; Richtering, W. *Macromolecules* **2002**, *35* (10), 4064-4074.

Products (pharmaceutical, detergent, dispersant, coating, composite, and battery electrolyte formulations)

- Biosurfactants, natural alternatives to synthetic surfactants: Physicochemical properties and applications. Jahan, R.; Bodratti, A. M.; Tsianou, M.; Alexandridis, P. *Adv. Colloid Interface Sci.* **2020**, *275*, 102061.
- Amphiphilic block copolymers in drug delivery: Advances in formulation structure and performance. Bodratti, A. M.; Alexandridis, P. *Expert Opin. Drug Deliv.* **2018**, *15* (11), 1085-1104.
- Therapeutic surfactant-stripped frozen micelles. Zhang, Y.; Song, W.; Geng, J.; Chitgupi, U.; Unsal, H.; Federizon J.; Rzayev, J.; Sukumaran, D. K.; Alexandridis, P.; Lovell, J. F. *Nature Communications* **2016**, *7*, 11649.
- Composite polymer electrolytes. Wang, W.; Alexandridis, P. *Polymers* **2016**, *8* (11), 387.
- Block copolymer-nanoparticle composites: Structure, functional properties, and processing. Sarkar, B.; Alexandridis, P. *Progress in Polymer Science* **2015**, *40* (1), 33-62.

Processes (adsorption, drying, swelling, dissolution, emulsification)

- Fluorinated surfactant adsorption on mineral surfaces: Implications for PFAS fate and transport in the environment. Alves, A. V.; Tsianou, M.; Alexandridis, P. *Surfaces* **2020**, *3* (4), 516-566.
- Population ensemble modeling of biomass dissolution. Ghasemi, M.; Tsianou, M.; Alexandridis, P. *Chemical Engineering Journal* **2018**, *350*, 37-48.
- Dissolution of semicrystalline polymer fibers: Numerical modeling and parametric analysis. Ghasemi, M.; Singapati, A. Y.; Tsianou, M.; Alexandridis, P. *AIChE Journal* **2017**, *63* (4), 1368-1383.
- Effect of phase behavior on emulsification. Kaizu, K.; Alexandridis, P. *J. Colloid Int. Sci.* **2016**, *466*, 138-149.
- Evaporation of water from structured surfactant solutions. Alexandridis, P.; Munshi, S. Z.; Gu, Z. *Industrial & Engineering Chemistry Research* **2011**, *50* (2), 580-589.

Templated synthesis of nanomaterials (metal, semiconductor, carbon, polymer)

- Large-diameter and heteroatom-doped graphene nanotubes decorated with transition metals as carbon hosts for lithium sulfur batteries. Ogoke, O.; ...; Su, D.; Alexandridis, P.; Wu, G. *J. Mater. Chem. A* **2019**, *7* (21), 13389-99.
- Clicking biodegradable nanoparticles and nanocapsules by UV-induced thiol-ene cross-linking in miniemulsions. Zou, J.; Hew, C. C.; Themistou, E.; Li, Y.; Chen, C.-K.; Alexandridis, P.; Cheng, C. *Adv. Mater.* **2011**, *23*, 4274-4277.
- Growth of ZnSe and CdSe nanostructures in self-assembled block copolymer-stabilized templates. Karanikolos, G. N.; Alexandridis, P.; Mountziaris, T. J. *Mater. Sci. Eng. B - Adv. Funct. Solid-State Mater.* **2008**, *152* (1-3), 66-71.
- Ag and Au monometallic and bimetallic colloids: Morphogenesis in amphiphilic block copolymer solutions. Sakai, T.; Alexandridis, P. *Chemistry of Materials* **2006**, *18* (10), 2577-2583.