Exponent®
Engineering & Scientific Consulting


# Hilda Buss, Ph.D., P.E.

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## Professional Profile

Trained as a chemical engineer, Dr. Buss focuses on structure-property relationships in polymer systems. She has applied this expertise to a variety of applications including coatings, personal care products, and batteries.

Dr. Buss is well versed in numerous polymerization methods (including free radical, controlled free radical, emulsion, anionic, and solid phase synthesis) and characterization techniques (including DSC, GPC, NMR, FTIR LC-MS, and TGA). She routinely utilizes these methods and techniques to assist in the formulation of novel materials for commercial products such as paints, creams, artificial stucco, and detergents.

Prior to joining Exponent, Dr. Buss worked at Dow Chemical, developing new monomers for use in acrylic emulsion polymerization for binders and rheology modifiers. These latexes were used in a range of applications including skin protection, coatings, and construction materials. While at Dow she also developed methods for evaluating primary cleaning in the auto-dishwashing market, and used data analytics to optimize the operation of several industrial waste water treatment plants. During her time at the University of California at Berkeley, Dr. Buss' research was focused on marine antifouling coatings and high transference number electrolytes for batteries.

## Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, University of California, Berkeley, 2017

B.S., Chemical Engineering, Massachusetts Institute of Technology (MIT), 2011

National Science Foundation Graduate Research Fellow, 2012-2015

## Licenses and Certifications

Professional Engineer Chemical, California, #7075

## Prior Experience

Senior Engineer, Dow Chemical, 2017-2020

 

## Professional Affiliations

Society of Plastics Engineers (SPE) member (2020-present)

Participating Member of ASTM International (2022-present)

## Languages

Czech

## Patents

International patent application WO 2020/123198 A1: “Personal Care Formulation Comprising a Multistage Polymer with a Carbosiloxane”, Buss H. et al. June 2020

International patent application WO 2020/123197 A1: “Polymer Blend for Personal Care Formulation”, Buss H. et al. June 2020

International patent application WO 2020/123196 A1: “Multistage Polymer”, Buss H. et al. June 2020

## Publications

Buss, H., "Master Stakeholder Management." C&EN, May 26 2019.

Abbott, L.; Buss, H.; Thelen, J.; McCloskey, B.; Lawson, J. "Polyanion Electrolytes with Well Ordered Ionic Layers in Simulations and Experiment." Macromolecules (2019), 52 (15), 5518-5528.

Buss, H. G.; Chan, S. Y.; Lynd, N. A.; Mccloskey, B. D. Nonaqueous Polyelectrolyte Solutions as Liquid Electrolytes with High Lithium Ion Transference Number and Conductivity. ACS Energy Lett. (2017), 2, 481-487.

Diederichsen, K. M.; Buss, H. G.; McCloskey, B. D. "The compensation effect in the Vogel-Tammann-Fulcher (VTF) equation for polymer-based electrolytes." Macromolecules (2017), 50 (10), 3831-3840.

Calabrese D. R.; Wenning, B. M.; Buss, H. G.; Finlay, J. A.; Fischer, D; Clare, A. S.; Segalman, R. A.; Ober, C. K. " Oligopeptide-modified hydrophobic and hydrophilic polymers as antifouling coatings." Green Materials, (2017), 5 (1) 31-43.

Su, N. C.; Buss, H. G.; McCloskey, B. D.; Urban, J. J., Enhancing Separation and Mechanical Performance of Hybrid Membranes through Nanoparticle Surface Modification. ACS Macro Letters, 4(11): 1239-1243.

Leng, Chuan; Buss, H. G.; Segalman, R. A.; Chen, Z., Surface Structure and Hydration of Sequence-Specific Amphiphilic Polypeptoids for Antifouling/Fouling Release Applications. Langmuir, 31(34): 9306-9311.

Buss, H. G.*; van Zoelen, W.*; Ellebracht, N. C.; Lynd N. A.; Fischer, D. A.; Finlay, J.; Hill, S.; Callow, M. E.; Callow, J. A.; Kramer, E. J.; Zuckermann, R. N.; Segalman, R. A., Sequence of Hydrophobic and Hydrophilic Residues in Amphiphilic Polymer Coatings Affects Surface Structure and Marine Antifouling/Fouling Release Properties. ACS Macro Letters, 3(4). 364-368.

*co first authors

Bonner, D. K.; Zhao, X.; Buss, H. G.; Langer, R; Hammond, P. T.; “Crosslinked linear polyethylenimine enhances delivery of DNA to the cytoplasm,” Journal of Controlled Release (2013), 167 (1):101-107.

Engler, A. C.; Shulka, A.; Puranam, S.; Buss, H. G.; Jreige, N., Hammond, P. T., Effects of Side Group Functionality and Molecular Weight on the Activity of Synthetic Antimicrobial Polypeptides. Biomacromolecules, 12(5): 1666-1674.

Engler, A. C.; Bonner, D. K.; Buss, H. G.; Cheung, E.; Lee, H. I.; Hammond, P. T., The synthetic Tuning of Clickable pH Responsive Cationic Polypeptides and Block Copolypeptides. Soft Matter, 7(12): 5627-5637.

## Advisory Appointments

CalSEED Technical Advisory Board (2017-2020)