

CHEMISTRY SEMINAR

“Polymeric Fluorous Phases: From the Ultimate Limits of Low Polarity to Biocompatibility”

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CHEMISTRY DEPARTMENT

THE U. OF MINNESOTA



Wednesday, March 30

12:00 p.m.

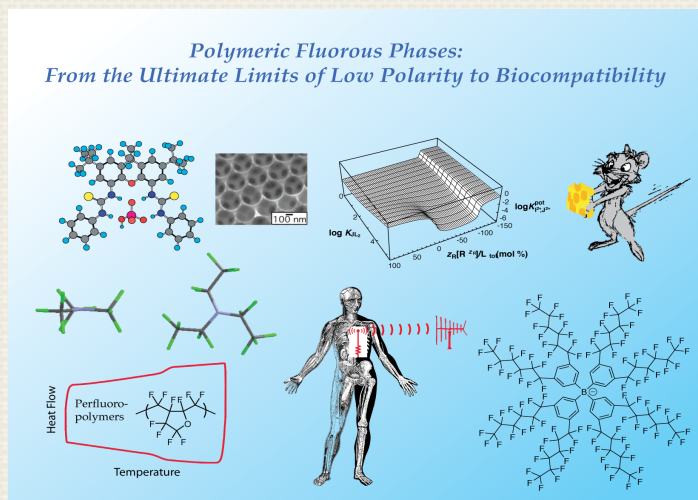
WSB-122

Abstract:

The use of sensors that sense chemical species (“chemical sensors”) as inexpensive, highly sensitive and selective analytical tools offers a variety of advantages, such as simplicity of measurement, high analysis throughput, rapid detection, and low cost of analysis. While such sensors are used in clinical laboratories for billions of measurements every year, applications in biomedical sciences, the food industry, and environmental monitoring are hindered by biofouling and the frequent need for recalibration. This talk will address the use of fluorous phases for potentiometric sensing. Fluorous phases are the least polar of all condensed liquid phases and offer significant advantages over conventional sensing membrane materials because they are extremely poor solvents for hydrophobic lipids and oils ubiquitous in biological systems. Moreover, the fluorous nature of the sensing membranes provides for extraordinary selectivities and chemical robustness. The talk will describe the development of plasticized perfluoropolymer membranes, fluorophilic receptors, and fluorophilic electrolyte salts.

Selected most relevant publications:

- * Fluorous Bulk Membranes for Potentiometric Sensors with Wide Selectivity Ranges: Observation of Exceptionally Strong Ion Pair Formation; Boswell, P.; Bühlmann, P. *J. Am. Chem. Soc.*, **2005**, *127*, 8958–8959.
- * Fluorous Polymeric Membranes for Ionophore-Based Ion-Selective Potentiometry, Lai, C.-Z.; Koseoglu, S. S.; Lugert, E. C.; Boswell, P. G.; Rábai, J.; Lodge, T. P.; Bühlmann, P., *J. Am. Chem. Soc.* **2009**, *131*, 1598–1606.
- * Electrochemistry with Media of Exceptionally Low Polarity: Voltammetry in a Fluorous Solvent, Olson, E. J.; Boswell, P. G.; Givot, B. L.; Yao, L.; Bühlmann, P., *J. Electroanal. Chem.* **2010**, *639*, 154–160.
- * Highly Selective Detection of Silver in the Low ppt Range with Ion-Selective Electrodes Based on Ionophore-Doped Fluorous Membranes, Lai, C.-Z.; Fierke, M. A.; Corrêa da Costa, R.; Gladysz, J. A.; Stein, A.; Bühlmann, P., *Anal. Chem.* **2010**, *82*, 7634–7640.



DR. BUHLMANN WILL MEET WITH STUDENTS AT 1:00 P.M. IN WSB-344