

SM3 Seminar Series Fall 2021

Thursday, August 26 | ZOOM | 12:00 pm

Molecular Scale Engineering of Polymer Membranes for Environment, Energy, and Health

Designing new membranes with a set of previously unachievable transport properties will have an enormous impact on many applications, including energy-efficient separations, energy storage and health-related devices. The advancement of these technologies is dependent on polymer membranes which selectively transport only desired penetrants while maintaining chemical stability.

Molecular transport in polymer membranes is greatly influenced by the chemical and morphological structures of polymers. Here two research projects are presented for designing new membranes using charged polymers for improved molecule separations. The transport mechanism in polymer membranes is studied from the fundamental perspectives of polymer-penetrant interactions and templating diffusion pathways for selective transport of small molecules.

First, controlling diffusional pathways in charged polymer membranes by solvent-free, green chemistry is presented for water purification and desalination. Second, designing highly structured polymer membranes for a new emerging biomedical application, “drug capture”, to minimize the toxic side effects of cancer chemotherapy drugs, is discussed.

Hee Jeung Oh, Ph.D.

Assistant Professor | Department of Chemical Engineering | Pennsylvania State University

The Oh research group studies the relationship between polymer chemistry, processing, structure, and transport properties for separation science. Dr. Oh's postdoctoral training, working in Prof. Nitash Balsara's research group at UC Berkeley, focuses on designing porous nanostructured polymers for energy storage, as well as for a new emerging biomedical application, “drug capture,” to minimize toxic side effects of cancer chemotherapy drugs. Hee Jeung has 15 peer-reviewed publications and two patents and has been recognized with several awards including the 3M Non-Tenured Faculty Award, Young Membrane Scientist Award from NAMS, and the University of Texas at Austin Professional Development Award.



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