



סמינר SEMINAR

Mesoporosity Through Block Copolymer Self-Assembly in Emulsion-Templated Polymers

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Porous polymers are of interest for a wide variety of applications including proton exchange membrane and controlled release. Emulsion templating can be used to generate macroporous polymers (>50 nm), while block copolymer (BCP) templating using a sacrificial polymer can be used to generate mesoporous polymers (2-50 nm). It should be possible to generate hierarchical porosity by using a mesopore-generating triblock copolymer (TBC) template within a macropore-generating emulsion template. The objective of this research was to develop hierarchically porous polymer monoliths by combining a TBC with a sacrificial midblock with emulsion templating using two approaches. System 1 uses 3-step approach: synthesizing a reactive TBC; crosslinking the TBC within a high internal phase emulsion (HIPE); and removing the degradable midblock. System 2 uses a 2-step approach: polymerizing and crosslinking the TBC within a HIPE; and removing the degradable midblock. Atom transfer radical polymerization (ATRP) was used to produce the TBC from a biodegradable polycaprolactone (PCL) macroinitiator (PCL-MI). System 1: a TBC based on glycidyl methacrylate (GMA) was successfully synthesized and PGMA with a density of 0.05 g/cm^3 was successfully crosslinked within an oil-in-oil emulsion. System 2: polymers with densities of around 0.170 g/cm^3 , based on combining styrene, divinylbenzene (DVB), and PCL-MI, were successfully synthesized within water-in-oil HIPEs. Immersion in 3 M NaOH removed $\sim 40\%$ of the PCL.

Supervisor: Prof. Michael S. Silverstein

ההרצאה תתקיים ביום ראשון, ה-10 באוקטובר 2021 בשעה 14:30
הסמינר יתקיים בזום

**The lecture will take place on Sunday, October 10, 2021 at 14:30
Seminar by Zoom**

<https://technion.zoom.us/j/93347063452>