SEMINAR סמינר

Synthesis of Porous Simultaneous Interpenetrated Polymer Networks through Emulsion Templating

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PolyHIPEs (PHs) are porous, emulsion-templated polymers synthesized in high internal phase emulsions (HIPEs), emulsions with over 74% internal phase. Interpenetrating polymer networks (IPNs), two or more chemically distinct polymer networks that are physically intertwined at the molecular scale and synthesized using mutually exclusive polymerizations, often exhibit synergistic properties. PHs based on IPNs have not been investigated thoroughly. The main objectives of this research were to design and synthesize IPN-PHs by employing simultaneous polymerizations within water-in-oil emulsions; to investigate the effects of the IPN-PH composition on the morphology, thermal properties, and mechanical properties; and to compare between IPN-PHs and semi-IPN-PHs. Highly porous PHs based on a poly(urethane urea) (PUU) as the one polymer (where the PUU was either based on a triol (PUU-T) or a diol (PUU-D)) and a copolymer of 80 wt % 2-ethylhexyl acrylate (EHA) and 20 wt % divinylbenzene (DVB) as the other polymer were successfully synthesized (where x-PUU indicates the PUU content). The porous morphologies depended upon the composition were different from those of the PUUs and P(EHA-co-DVB). The gel content was 80% for 50-PUU-T and only 38% for 50-PUU-D; thermogravimetric analysis exhibited one main degradation peak for 50-PUU-T and two separate degradation peaks for 50-PUU-D; interestingly, there was only one dynamic mechanical thermal analysis tan δ peak for the PHs. Both the extent of crosslinking and the modulus increased with an increase in the DVB content in the PH.

Advisor: Prof. Michael S. Silverstein

ההרצאה תתקיים ביום ראשון, ה-30 בדצמבר 2018 בשעה 14:30
באודיטוריום ע"ש דיוויד וואנג, קומה 3, בנין דליה מידן

The lecture will take place on Sunday, December 30th 2018 at 14:30
David Wang Auditorium, 3rd floor Dalia Maydan Bldg.

כיבוד קל יוגש לאחר הסמינר