



הפקולטה להנדסה כימית
ע"ש וולפסון
התוכנית הבין-יחידתית להנדסת
פולימרים
The Wolfson Department of Chemical
Engineering
The Interdepartmental Program in
Polymer Engineering

**Wolfson Department of Chemical Engineering Seminar in collaboration with the
Interdepartmental Program in Polymer Engineering**

Monday, April 28th, 2024 at 13:30

Room 6

Thermoplastic Epoxy: synthesis, properties, and applications

Faran Levy

MSc Seminar

Advisor: Prof. Charles E Diesendruck
The Interdepartmental Program in Polymer Engineering
Technion-Israel Institute for Technology

Epoxy-amine polymers are traditionally classified as thermosets due to their cross-linked structures, resulting in inherent limitations in processability, recyclability, and research methods. This study explores an alternative synthesis method for creating linear thermoplastic epoxy-amine polymers. By employing secondary amines under optimized reaction conditions, step-polymerization between diglycidyl ether of bisphenol A (DGEBA) and N,N'-diphenyl-p-phenylenediamine (DPPDA) was achieved. The resulting polymer exhibits high solubility in organic solvents, melt processability, and an amorphous structure with a glass transition temperature of 72°C. While retaining the stiffness associated with epoxy-amine systems, the polymer demonstrates lower strength and increased brittleness. This approach challenges the conventional understanding of epoxy-amine materials and provides a pathway for advancements in processability, recyclability, and research applications which were irrelevant for these polymers.

Refreshments will be served at 13:15.