



Wolfson Department of Chemical Engineering Seminar

Monday, October 26rd, 2026 at 13:30

Room 6

Development and Characterization of an Imine-Based Epoxy Vitrimer

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MSc Seminar

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This study investigates the development and characterization of a partly bio-based epoxy network, EVH, derived from vanillin, 1,6-hexanediamine, and epoxidized soybean oil. The material was designed to combine thermoset-like stability with dynamic imine bonds that could enable heat-induced network rearrangement and reprocessing.

A vanillin-derived hardener was synthesized through Schiff-base condensation and characterized using FTIR, ¹H NMR, and thermal analysis. The results supported the proposed imine-containing structure and retention of hydroxyl groups for subsequent epoxy curing. The hardener was then incorporated into an epoxy network, and the influence of curing duration on material properties was investigated.

Thermal, mechanical, dilatometry, and stress-relaxation measurements examined network stability, glass transition, deformation, and relaxation behavior. Tensile and reprocessing tests assessed mechanical performance following reprocessing. The work explores the potential of combining renewable feedstocks with dynamic covalent chemistry to develop durable polymer networks with improved end-of-life options.

Refreshments will be served at 13:15.