

Abstract Submitted
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Structure and dynamics of of solution polymerized polyureas¹

TAEYI CHOI, YOUMI JEONG, JAMES RUNT, The Pennsylvania State University — Polyureas consisting of alternating soft and hard (urea containing) segments exhibit physical properties that are closely related to their microphase separated structure, which consist of rigid (high Tg and sometimes crystalline) hard domains embedded in a matrix dominated by flexible polyether segments. Polyurea properties can be controlled over a rather broad range by varying the chemical structures, molecular weight of the components, and reaction stoichiometry. In the present study, we focus primarily on linear polyureas synthesized using methylene diphenyl diisocyanate and polytetramethylene oxide-di-p-aminobenzoate using a solution polymerization method. Soft segment (diamine) molecular weights were varied from 460 to 860 to 1200 g/mol and characterize their morphology, hydrogen bonding, mechanical behavior and dielectric properties upon varying molecular weight of diamines. This presentation will focus on our latest findings, particularly details of the microphase separated morphology and molecular dynamics as measured using dielectric relaxation spectroscopy

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