

Abstract Submitted
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To explore the nature of mechanical stress of polymeric glass by stress relaxation tests¹ XIAOXIAO LI, JIANNING LIU, PANPAN LIN, SHIQING WANG, University of Akron — In a glassy polymer intermolecular interactions glue all segments into one single macroscopic piece thanks to attractive van der Waals bonding. The cohesive strength of such a primary structure is rather weak. If the molecular weight is sufficiently high, the covalent bonding can "magically" take part in the cohesion of the polymer glass through formation of a chain network. This picture of hybrid structure enables us to delineate the nature of mechanical stress [1]. Under either extension or compression, we performed stress relaxation experiments in both pre-yield and post-yield regimes to illustrate how inter-segmental and intra-segmental components of stress emerge in the different regimes. [1] S.-Q. Wang, S. Cheng, P. Lin, and X. Li, J. Chem. Phys. 141, 094905 (2014).

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Xiaoxiao Li
University of Akron

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