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**Observation of high viscous stress of oriented polyolefin under uniaxial tensile** QIANG FU, BING NA, HAO ZOU, KE WANG, QIN ZHANG, Department of Polymer Science & Materials, Sichuan University, State Key Laboratory of Polymer Materials Engineering, Chengdu, 610065, China, CHARLES C. HAN, PPCL, Joint Lab. of Polymer Science and Materials, Institute of Chemistry, Chinese Academy of Science, Beijing 100080, China — In this work, by means of stress relaxation experiments, the viscous stress at various strains during tensile deformation of oriented polyolefin samples, including high density polyethylene (HDPE), linear low density polyethylene (LLDPE) and isotactic polypropylene (iPP), has been determined. The viscous stress in the oriented samples takes up to 50 -70% of the total stress, which is unusually high, compared with their isotropic counterparts. Moreover, the enhanced modulus of oriented polyolefin was found not mainly caused by the existence of shish-kebab structure, but mainly come from the contribution of viscous stress. The result is new and provides deep understanding of the origin of high modulus for oriented polymers.

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