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Dye Reorientation as a Probe of Stress-induced Mobility in PMMA Glasses HAU-NAN LEE, University of Wisconsin-Madison, KEEWOOK PAENG, STEPHEN SWALLEN, MARK EDIGER — To understand the response of molecular motions to deformation, we perform optical measurements of dye reorientation in PMMA glasses under stress. The reorientation of probes can be used to monitor the segmental dynamics of a polymer melt. We utilize this method to quantitatively determine the stress-induced mobility in PMMA glass during tensile creep deformation. At 377 K (T_g-18 K), a stress of 20 MPa accelerates the mobility by a factor of 100, while 11 MPa has almost no effect. After removing the stress, we observe that the enhanced mobility slowly disappears, even though the overall strain is still very large.

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