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**Measurements of Viscosity and Dynamics of Thin Films of Organic Glass TPD via Hole Growth Dewetting Studies**[1] KAREEM WAHID, University of Texas Pan American, YUE ZHANG, MU LI, ZAHRA FAKHRAAI, Department of Chemistry, University of Pennsylvania — In this study, we aim to measure the viscosity of thin glassy films of the small organic molecule N,N′-Bis(3-methylphenyl)-N,N′-diphenylbenzidine (TPD). Organic glasses such as TPD have various applications in organic light emitting diodes (OLED), and organic photovoltaics. An understanding of the origin for nano-scale properties (e.g. viscosity) would allow for better design of such devices in future applications. Viscosity is simple to measure in bulk systems but challenging at the nanometer scale. Dewetting experiments provide a simple and non-invasive method to measure viscosity in thin film systems. By following dewetting kinetics over time, we are able to identify material related viscous dissipation and substrate related frictional dissipation involved during dewetting. Both homogeneously and heterogeneously nucleated holes have been observed on TPD films of various thicknesses or various substrates. There is reasonable agreement between these observations and with full-slip dewetting models among heterogeneously nucleated holes. However, this is not observed in homogeneously nucleated holes. Careful substrate treatment and control of substrate properties influence the slip length and the dewetting dynamics.

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