

Abstract Submitted
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Structure and dynamics of molecules undergoing lubricated sliding KUMAR NANJUNDIAH, ANISH KURIAN, PING HSU, ALI DHINOJWALA, The University of Akron — The presence of a thin fluid layer is crucial in reducing wear and energy dissipation and is important in many areas such as tribology, adhesion, micro-fluidics, study of earthquakes and biolubrication. It has been shown using force measurements that the molecules undergo abrupt liquid-to-solid transition upon confinement and shear melting on sliding. Experiments and simulations have provided important clues but no definite answers. We have designed a friction cell that allows us to simultaneously probe the structure of the confined molecules using infrared-visible sum frequency generation spectroscopy in conjunction with friction and adhesion. Changes in the structure of liquid molecules upon confinement and during sliding will be presented.

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