NICHOLAS SHEETZ, CLAYTON SMITH, and MENGYANG LI, Department of Chemistry, Shepherd University, Shepherdstown, WV 25443. Isothermal measurements of a Langmuir monolayer of a non-polar fluorocarbon chain molecule.

Traditionally Langmuir monolayers and lipids bilayers (including cell membranes) on water interfaces are made of amphiphilic molecules with both polar hydrophilic and non-polar hydrophobic parts. It has been discovered that non-polar fluorocarbon chain molecules without the polar hydrophilic part, $F(CF_2)_{20}F$, can also form Langmuir monolayers on water. Here we report the surface pressure vs. area isotherm measurements of a $F(CF_2)_{20}F$ film on water, which show the film's maximum compression modulus (greatest resistance to lateral compression) at about 30 $Å^2$/molecule, independent of the compression speed, like the Langmuir monolayers of long chain saturated fatty acids do. The cross-section area of the fluorocarbon chain is 28.1 $Å^2$ in 3-D crystalline $F(CF_2)_{20}F$. Our measurements confirm the formation of a Langmuir monolayer by $F(CF_2)_{20}F$, a non-polar fluorocarbon chain molecule. We observed a general trend that greater the lateral compression speed, lower the maximum compression modulus, lower the resistance to lateral compression. Nicholas Sheetz and Clayton Smith are grateful to financial support from the National Science Foundation through the SOARS Research Fellowship at Shepherd University.