

MICHAEL D. C. SMITH, GERREN D. SIMMS & MENGYANG LI, Department of Chemistry, Shepherd University, Shepherdstown, WV, 25443. Isotherm and X-ray measurements of a Langmuir monolayer of a non-polar hydrocarbon 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 hydrocarbon chain molecules without the polar hydrophilic part, can also form Langmuir monolayers on water when the chain molecule has more than 30 carbon atoms. Here we report the surface pressure vs. area isotherm measurements of a $\text{H}(\text{CH}_2)_{36}\text{H}$ film on water, which show the film's maximum compression modulus (greatest resistance to lateral compression) at about $19 \text{ \AA}^2/\text{molecule}$, independent of the compression speed, like the Langmuir monolayers of long chain saturated fatty acids do. The cross-section area of the hydrocarbon chain is about 19 \AA^2 . Our measurements confirm the formation of a Langmuir monolayer by $\text{H}(\text{CH}_2)_{36}\text{H}$, a non-polar hydrocarbon chain molecule. X-ray measurements reveal structural information of the monolayer. This work was supported by the US National Science Foundation and NASA EPSCoR Programs and Shepherd University.