

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Study of propane films adsorbed on Purified HiPco Carbon Nanotubes¹ TOYOHISA FURUHASHI, DINESH RAWAT, ALDO MIGONE, Department of Physics Southern Illinois University — We investigated the adsorption characteristics of propane on purified HiPco single-walled carbon nanotubes for coverages limited to the first layer. We found two prominent substeps present in the monolayer; this suggests the presence of at least two distinct groups of binding energy sites in the substrate. The results are similar to those that we have found for ethane, but different from those we measured for butane, on the same substrate. We compare and contrast the characteristics of the isotherms for these three alkanes. A high-binding-energy (low-pressure) adsorption isotherm substep is present for all three alkanes. By contrast, the high- pressure substep (corresponding to adsorption on the outer surface area of the nanotubes bundles) shows a gradual smearing with increasing alkane length; this feature is barely resolvable for butane. We also found a gradual increase in the binding energy of alkane molecules with the increasing carbon chain length. This result confirms findings of simulation results for similar systems.

¹This research was supported by NSF through grant # DMR-0705077.

Dinesh Rawat
Department of Physics Southern Illinois University

Date submitted: 19 Nov 2008

Electronic form version 1.4