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Dependence of adsorption kinetics on the length of the alkane adsorbate[1] DINESH RAWAT, TOYO FURUHASHI, ALDO MIGONE, Department of Physics, Southern Illinois University at Carbondale, IL-62901, USA — We present the results of an adsorption kinetics study of methane, ethane, propane, butane and pentane films on purified HiPco SWNTs. These studies consisted of monitoring the time evolution of the adsorbate gas pressure, for different fractional coverages, along adsorption isotherms. For methane and ethane, the times for the pressure to equilibrate were found to decrease as the fractional coverage increased. However, for propane, butane and pentane, a reverse trend was observed. We speculate that the observed increase in the equilibration time with coverage for the longer alkanes is due to rearrangement of molecules in the adsorbed film. Results for the adsorption kinetics of butane on a cell containing no substrate will also be presented, and compared to those observed for adsorption on the nanotubes. The observed differences in adsorption kinetics suggest the possibility of using adsorption as a means to achieve the separation of gaseous alkane mixtures.

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