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Delayering of Intermediate-Length Alkanes Adsorbed on Solid Surfaces[1] H. TAUB, M. BAI, A. DIAMA, U. Mo.-Columbia, K. KNORR, U. Saarbrucken, U.G. VOLKMANN, P. U. Católica Chile, F.Y. HANSEN, Tech. U. Denmark — We have recently discovered that a film of the intermediate-length alkane, dotriacontane (n-$C_{32}H_{66}$ or C32) does not completely wet SiO_2 and highly oriented graphite surfaces on a nanometer length scale.[2] In a narrow temperature range near the bulk melting point T_b, we observe a single layer of C32 molecules oriented with their long axis perpendicular to the surface. On heating just above T_b, these molecules undergo a delayering transition to three-dimensional droplets that remain present up to their evaporation point. Here we report noncontact Atomic Force Microscopy and synchrotron x-ray measurements indicating that a similar delayering transition occurs for films of other intermediate-length alkanes: C24, C25, C30, and C36 deposited from solution onto a SiO_2 surface. These results raise a number of interesting questions including whether the delayering transition is driven by conformational changes in the molecules and what implications the nonwetting behavior may have for lubricating nanoscale devices.

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[2]M. Bai *et al.*, cond-mat/0611497.

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