

Abstract Submitted
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Studies of the Dynamics of Alkane Nanoparticles¹ S.-K. WANG, M. BAI, H. TAUB, M. RHEINSTADTER, U. Mo.-Columbia, J. R. D. COPLEY, V. GARCIA SAKAI, G. GASPAROVIC, NIST, U. G. VOLKMANN, P. U. Catolica Chile, F. Y. HANSEN, Tech. U. of Denmark — Our AFM and synchrotron x-ray scattering measurements on dotriacontane (C₃₂H₆₆ or C32) deposited on SiO₂-coated Si(100) substrates reveal mesa-shaped nanoparticles that have an orthorhombic structure in which the C32 molecules are aligned perpendicular to the SiO₂ surface.² To investigate their dynamical properties, we have used both the backscattering and disk chopper spectrometers at NIST covering a wide range of time scales (1 ps – 4 ns). Elastic scans obtained on both spectrometers show step-like changes in intensity as a function of temperature indicating the existence of phase transitions below the bulk C32 melting point. One of these steps occurs at the crystalline-to-rotator phase transition of bulk C32, but there is a second step at still lower temperature of unknown origin. The similarity of the elastic scans on the two spectrometers suggests that the crystalline-to-rotator phase transition involves diffusive motion spanning a wide range of time scales. ²M. Bai *et al.*, Europhys. Lett. **79**, 26003 (2007).

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