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Wetting of topological nano-patterned surfaces O. GANG, B. OCKO, Brookhaven National Lab, K. ALVINE, M. FUKUTO, P. PERSHAN, Harvard University, C.T. BLACK, IBM — We have investigated the evolution of simple hydrocarbon and fluorocarbon liquid films on nano-patterned surfaces of near-hexagonally packed 20 nm wide nano-cavities [1]. Our x-ray measurements show that the behavior of wetting films on patterned surfaces differs from the expected $\Delta\mu^{-1/3}$ dependence found for the van der Waals interacting flat films [2]. Two different regimes (filling and growing) for the wetting film evolution were observed as a function of the chemical potential offset $\Delta\mu$. The filling regime exhibits a $\Delta\mu^{-3/4}$dependence for the adsorption of the liquid film into nanocavity; a significant enhancement compared to the flat surface. These results qualitatively confirm the theoretically predicted increase of the wetting exponent for the curved surface. However, quantitatively, the measured exponent for the paraboloid-like cavity is considerably lower than the predicted value [3].

1. C. T. Black et al, *Appl. Phys. Lett.*, 79, **409,** (2001).

2. O. Gang et al, M. Fukuto, P.Huber, P.Pershan, *Coll. and Surf. A* **206**, 293, 2002

3. Rascon, C. and A.O. Parry, *Nature*, **407**: p. 986 (2000); Robbins, M.O et al *Phys. Rev. A*, 43(8), 4344 (1991).

O. Gang
Brookhaven National Lab

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