

Abstract Submitted
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Static and Dynamic Aspects of Surfactant Surface Aggregates studied by AFM HANNES SCHNIEPP, DUDLEY SAVILLE, ILHAN AKSAY, Department of Chemical Engineering, Princeton University — Using AFM, we show that surfactants form micellar aggregates of varying morphology, depending on the surface structure. While all previous studies were limited to atomically flat substrates, we achieve imaging the micelles on rough gold. By gradually annealing these surfaces, we show the influence of roughness on the aggregate structures. For crystalline gold (111), aligned, hemi-cylindrical micelles that recognize the symmetry axes of the gold lattice are found. With increasing roughness, the degree of organization of the aggregates decreases. We also show that the micellar pattern on HOPG and gold(111) surfaces changes with time and responds to perturbations in a self-healing way. Our results suggest that this organization happens at the molecular scale. Theoretical analysis for HOPG, however, show that the micelle orientation cannot be explained on the molecular level, but the anisotropic van der Waals interaction between micelles and HOPG has to be considered as well [1].

[1] Saville, D. A.; Chun, J.; Li, J.-L.; Schniepp, H. C.; Car, R.; Aksay, I. A., accepted by Physical Review Letters.

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