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Frictional properties of hydrophobic nanopatches in different solvents. MATTEO CASTRONOVO, University of Trieste, Trieste, Italy, ROBERT HUDEJ, Synchrotron Trieste, Trieste, Italy; International School for Advanced Studies (ISAS), Trieste, Italy, DENIS SCAINI, MARTINA DELL'ANGELA, Synchrotron Trieste, Trieste, Italy; Department of Physics, University of Trieste, Trieste, Italy, LOREDANA CASALIS, Synchrotron Trieste, Trieste, Italy, GIACINTO SCOLES, Synchrotron Trieste, Trieste, Italy; International School for Advanced Studies (ISAS), Trieste, Italy; Princeton University, Princeton, NJ — Controlling friction at the micro- and nano-scale is of crucial importance, especially in applications as micromachines. In order to develop new ways of controlling friction, it is extremely important to understand how friction depends on the atomic structure of the interface. Using nanografting, an AFM-assisted lithographic technique, we correlated frictional properties of alkanethiols with hydrophobic termination (CH3) and of alkenethiols with hydrophilic termination (OH) on the same surface in water and in 2-butanol, using the same tip. In 2-butanol friction on C11OH is higher than on the C18 patch since OH groups on the SiO2 AFM tip surface interact more strongly with OH groups on C11OH than with CH3 groups on C18. In water, due to the strong interactions between the OH groups, the solvent molecules form an ordered layer on OH terminated SAM, which can be penetrated by the AFM tip only at relatively high applied forces..

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