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A closer look on the thermo-responsive behavior of ultrathin pNIPAM films - relating interfacial molecular transitions to macroscopic properties PATRICK KOELSCH, VOLKER KURZ, Karlsruhe Institute of Technology, STEFAN ZAUSCHER, Duke University — The thermo-responsive behavior of thiol-modified poly(N-isopropylacrylamide) (pNIPAM) films immobilized on gold were probed by in situ broadband sum-frequency generation (SFG) spectroscopy, ellipsometry and capturing bubble contact angle. The pNIPAM films were prepared by atom transfer radical polymerization using a nitro-biphenyl-thiol-SAM on a polycrystalline gold surface as a substrate. Macroscopic properties of the film during the lower critical solution temperature (LCST) are tracked in detail by ellipsometry and capturing bubble contact angle allowing us to measure the thickness and water content within the film as well as the surface energy. These results are correlated with data acquired by in situ SFG spectroscopy, an intrinsic surface specific method probing LCST dynamics on a molecular scale.

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