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Comparative STM study of azobenzene derivatives on bare and insulator coated metal surfaces NIV LEVY, MATTHEW J. COMSTOCK, JONGWEON CHO, ARMEN KIRAKOSIAN, CARINE EDDER, JEAN M. J. FRECHET, FRANK LAUTERWASSER, JESSICA HARVEY, DIRK TRAUNER, M. F. CROMMIE, Dept. of Physics, Dept. of Chemistry, UC Berkeley; Mat. Sci. Div, Lawrence Berkeley Natl. Lab — Photoactive molecules, such as azobenzene and its derivatives, have great potential for nanoscale opto-mechanical applications. However, one of the main difficulties in optical actuation of singe molecules at a surface is decoupling them from the electronic states of the substrate. One technique to accomplish this is to coat the substrate with a thin insulating layer, while another is to functionalize the molecule with "spacer legs" to lift it off the surface. We have conducted a comparative study of adsorption and self-assembly behavior of bare azobenzene, functionalized bis-tert-butyl-azobenzene, and functionalized tetra-tert-butyl-azobenzene molecules on bare and insulator coated metal surfaces using a variable temperature UHV STM. We observe a variety of temperature dependent molecular configurations, from which we infer the degree of molecule/surface decoupling due to surface modification and molecular functionalization.

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