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The self-assembly of alkyl-trichlorosilanes on model surfaces of biphenylthiols SVETLANA STOYCHEVA, 1, JOERG FICK, 1, STEFFEN FRANZKA, 2, NILS HARTMANN, 2, ALEXANDER KORNVIAKOV, 3, AVI ULMAN, 3, MICHAEL HIMMELHAUS, 1, MICHAEL GRUNZE, 1, APPL. PHYS. CHEMISTRY, UNIV. HEIDELBERG TEAM, DEPT. OF PHYS. AND THEO. CHEMISTRY, UNIV. ESSEN TEAM, DEPT. OF CHEM. ENGINEERING, POLYTECHNIC UNIV., BROOKLYN, NY TEAM — Despite of its technological relevance, the self assembly of alkyl-trichlorosilanes onto oxidized metal or semiconductor surfaces is still not fully understood. Phenomena, such as island formation and polymerization, hamper the formation of densely packed and well-ordered self assembled monolayers (SAM). To elucidate the influence of the distribution of OH groups on the surface, we have used 4-mercaptobiphenyls (MBP) to prepare stable, molecularly engineered surfaces and used them as substrates for the assembly of alkyl-trichlorosilanes. The monolayers of MBP as well as the bilayer assemblies were characterized by contact angle, ellipsometry, IR spectroscopy, X-ray photoelectron spectroscopy, sum frequency generation, and AFM. In combination with the results of ab initio calculations, a detailed picture of the film formation of the silane overlayer could be achieved.

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