

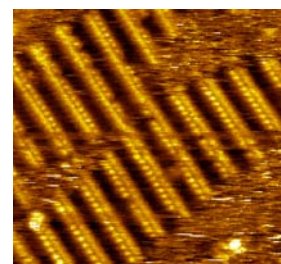
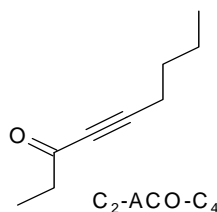
## EARLY STAGES IN THE 2D SELF-ASSEMBLY OF STABILIZED ALKYNE DERIVATIVES ON Au(111) SURFACES: ROLE OF THE TRIPLE BOND

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The understanding of local molecule-substrate and molecule-molecule interactions is a prerequisite in the controlled growth of organized 2D supramolecular assemblies on surfaces. In particular, we recently discovered that, similarly to thiol derivatives, trimethylsilylacetylene (TMSA) derivatives also form self-assembled monolayers on reconstructed Au(111) surfaces.<sup>1</sup> Self-assembly of TMSA compounds occurs through the formation of a surface Si-Au chemical bond (“chemisorption”), the Si-atom of TMSA being activated by the C≡C bond. We also observed that TMSA and linear Ge-bonded alkynes (TMGA) self-assemble in lamellae when deposited on gold.<sup>2</sup>

*Molecular structure of non-4-yn-3-one and STM image  
(25x25nm<sup>2</sup>) of the lamellae structure on Au(111)*



In order to investigate the specific role of the C≡C bond in the adsorption mechanism of these compounds, we investigate the self-assembly on Au(111) surfaces of a series of alkynes stabilized by various groups. We illustrate here this approach with the non-4-yn-3-one compound which self-assembles on Au(111) in parallel lamellae with molecules oriented normal to the lamellae direction (see Fig. above). High resolution STM images reveal several analogies with TMSA and TMGA on gold which evidence the essential role of the interaction between gold and the C≡C bond.

<sup>1</sup> (a) Marchenko, A., Katsonis, N., Fichou, D., Aubert, C., Malacria, M. *J. Am. Chem. Soc.* **2002**; *124*, 9998. (b) Katsonis N., Marchenko A., Taillemite S., Fichou D., Chouraqui G., Aubert C., Malacria M. *Chem. Eur. J.* **2003**, *9*, 2574.

<sup>2</sup> Nion, A., Simon, C., Popoff, A., Marchenko, A., Fichou, D., *Forum Microscopies à Sondes Locales*, March **2005**, France.