

From supramolecular self-assembly to two-dimensional polymer

Sylvain Clair

CNRS-IM2NP, Aix-Marseille Université, Faculté des sciences de St Jérôme, Marseille 13013, France

The recent developments in the field of surface-supported supramolecular chemistry have produced a whole range of well-ordered self-assembled organic systems [1]. Because of the weak nature of non-covalent bonds, practical applications are however rather limited. In some cases, alternative solutions based on intermediate-strength bonding could be achieved thanks to enhanced hydrogen bonds [2]. Considering efforts to create more robust networks, the first demonstrations of covalent polymerization performed directly at surfaces are very promising [3]. The formation mechanism is here much more complex due to the necessary activation of a chemical reaction and to the irreversible character of the process, what gives rise to unexpected effects. Recently, by use of a metal-directed surface reaction, a fully 2D-conjugated organometallic sheet could be grown on metals as well as on a thin insulating film [4].

[1] J. V. Barth, *Annu. Rev. Phys. Chem.* **58**, 375, (2007)

[2] R. Pawlak, *ChemPhysChem* **10**, 1032 (2009)

[3] N. A. A. Zwaneveld et al., *JACS* **130**, 6678 (2008)

[4] M. Abel et al., *JACS* **133**, 1203 (2011)