Electronic Supplementary Material (ESI) for RSC Advances

Supplementary Information

Different types of phase separation in binary monolayers of long chain alkyltrichlorosilanes on silicon oxide

Simon Desbief[a,b,c#], Lionel Patrone[a,b,c*], Didier Goguenheim[b,c], Dominique Vuillaume[d]
[a] Aix-Marseille Université, IM2NP
[b] CNRS, IM2NP (UMR 7334)
[c] Institut Supérieur de l'Electronique et du Numérique, IM2NP
Maison des Technologies, Place G. Pompidou, F-83000, Toulon, France.
[d] Institute for Electronics, Microelectronics and Nanotechnology (IEMN), CNRS/Univ. of Lille, Avenue Poincaré, BP 60069, F-59652 cedex, Villeneuve d'Ascq, France.
E-mail : simon.desbief@umons.ac.be, lionel.patrone@im2np.fr, didier.goguenheim@im2np.fr, dominique.vuillaume@iemn.univ-lille1.fr
* To whom correspondence should be addressed. e-mail: lionel.patrone@im2np.fr. Tel.: +33 494 038 950. Fax: +33 494 038 951.
[#] Current address: Université de Mons, Service de Chimie des Matériaux Nouveaux, 22 place du parc, B - 7000 Mons (Belgium) ; e-mail : simon@desbief.com

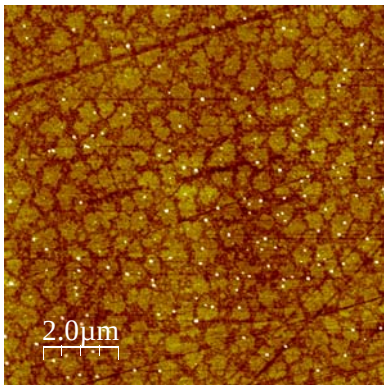

Fig. S1. AFM image (10x10µm²) of C_{30}/C_{16}, R_{Sol} =20, LTLH at a different area of the same sample as that of Fig. 2a).

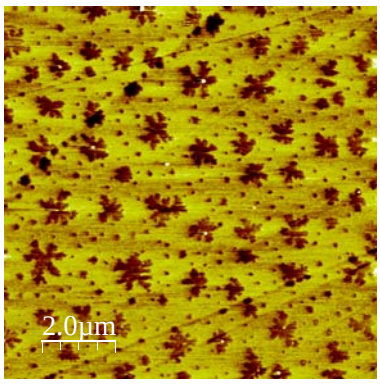

Fig. S2. AFM image (10x10µm²) of C_{30}/C_{18}, R_{Sol} =1, HTHH at a different area of the same sample as that of Fig. 2b).

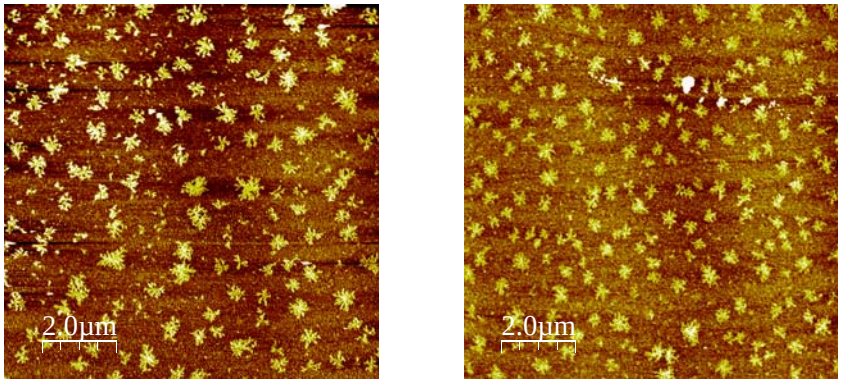

Fig. S3. AFM images (10x10µm²) of C_{30}/C_{16}, R_{Sol} =20, LTLH of two different areas of the same sample as that of Fig. 2c).

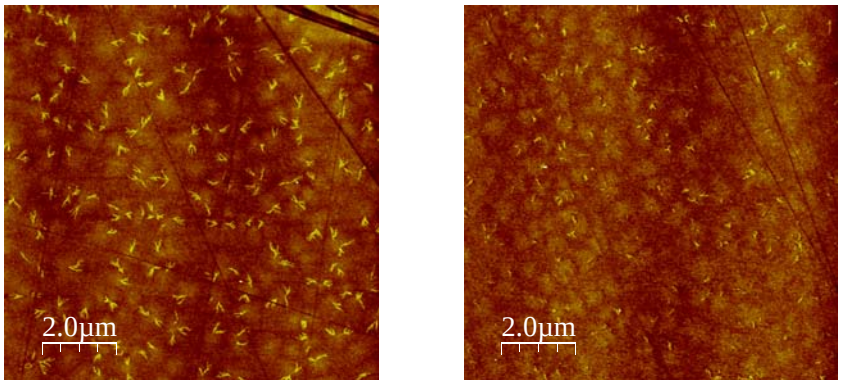

Fig. S4. AFM images (10x10µm²) of two different samples exhibiting "filaments", prepared at the same conditions within the same deposition experiment : C_{30}/C_{16}, R_{Sol} =1, LTLH.

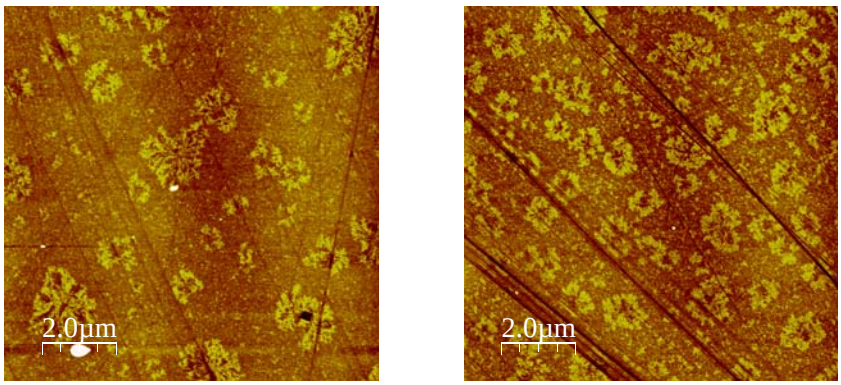

Fig. S5. AFM images (10x10µm²) of two different samples prepared at the same conditions within the same deposition experiment : C_{30}/C_{16}, R_{Sol} =0.5, LTLH.

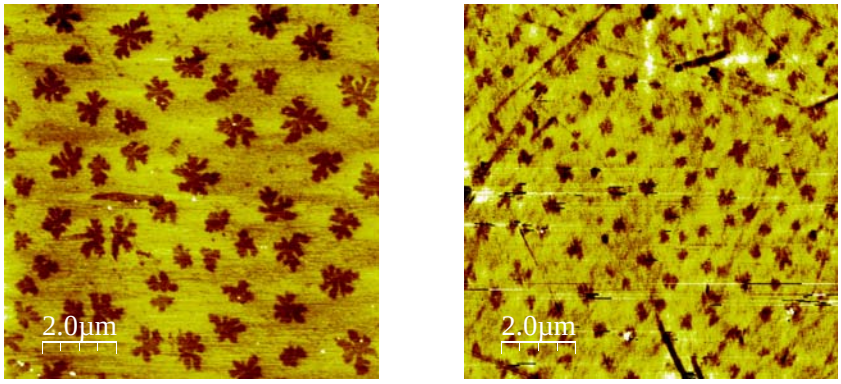

Fig. S6. AFM images (10x10µm²) of two different samples prepared at the same conditions within distinct deposition experiments : C_{30}/C_{18}, R_{Sol} =1, HTLH.

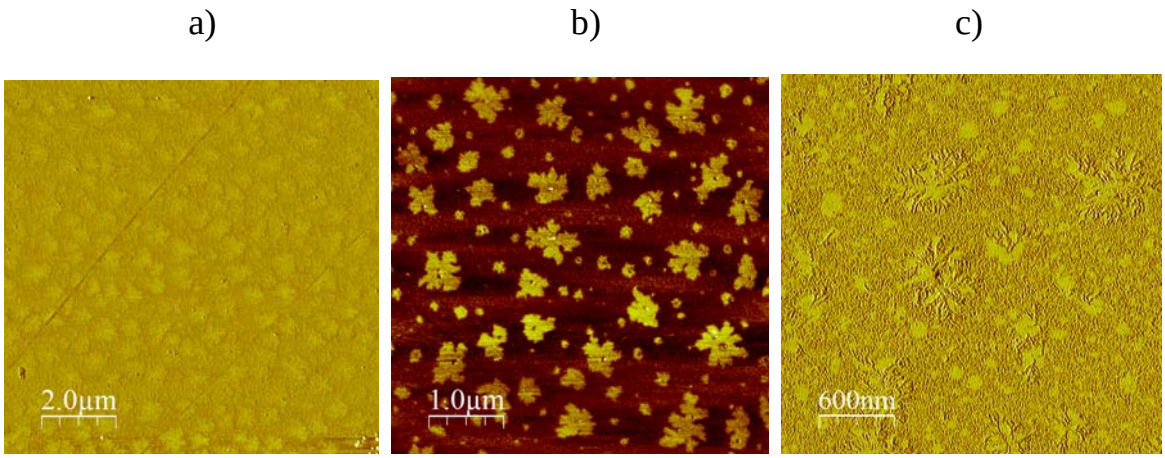

Fig. S7. Phase AFM images (10x10µm², z scale = 15°) corresponding to topography AFM images of Fig. 2.

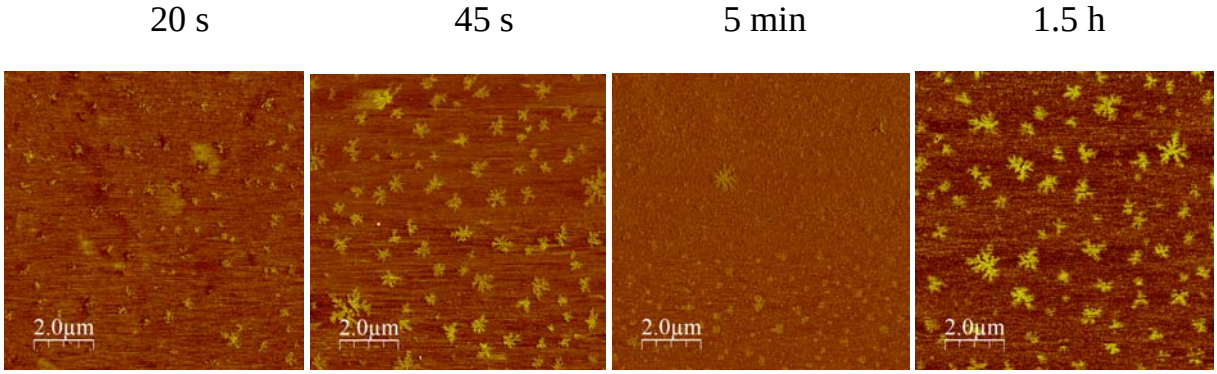

Fig. S8. Phase AFM images (10x10µm², z scale = 15°) corresponding to topography AFM images of Fig. 5.

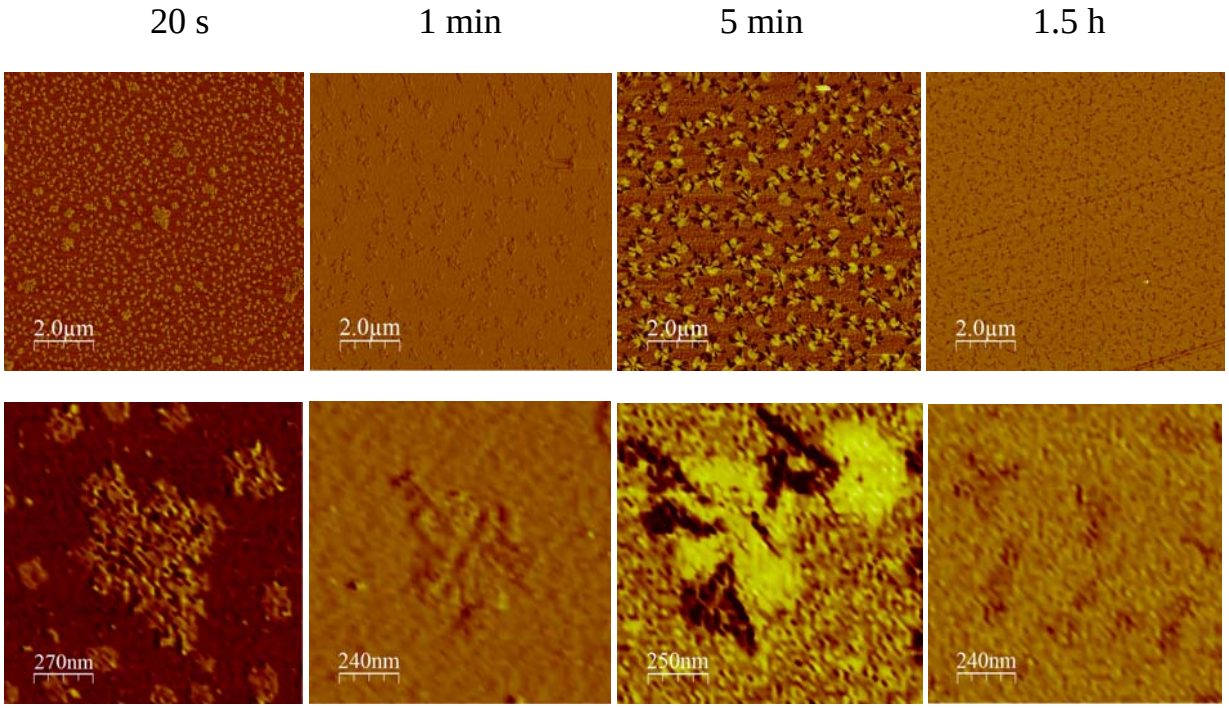

Fig. S9. Phase AFM images (10x10µm², z scale = 15°) corresponding to topography AFM images of Fig. 7.

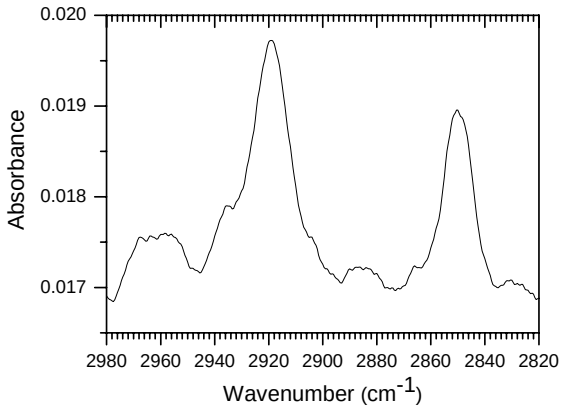

Fig. S10. FTIR spectrum of binary C_{30}/C_{18} SAM, R_{Sol} = 20, prepared at LTHH. Intense symmetric and asymmetric stretching bands of methylene moieties are positioned at ~2850 cm^{-1} and ~2919 cm^{-1} respectively. Weak broad bands at ~2960 cm^{-1} and ~2885 cm^{-1}, and the shoulder at ~2935 cm^{-1} should be attributed to methyl terminal groups.

		C_{30}/C_{16}				C_{30}/C_{18}		C_{30}/C_{20}			
		0.05	1	10	20	1	20	0.1	1	10	20
LTLH	$T_{ell.}$ (Å)	*29.2*	*23.2*	*27.0*	*43.0*	*30.4*		*28.0*	*37.2*	*38.6*	
	T_{AFM} (Å)	*27.4*	*24.5*	*27.0*	*34.4*	*30.0*		*28.7*	*35.0*	*39*	
LTHH	$T_{ell.}$ (Å)						*36.0*		*31.2*		*34.0*
	T_{AFM} (Å)						*36.9*		*29.1*		*35.0*
HTHH	$T_{ell.}$ (Å)					*33.0*			*28.5*	*31.0*	
	T_{AFM} (Å)					*38.3*			*29.7*	*32.0*	
HTLH	$T_{ell.}$ (Å)					*29.0*	*38.5*				
	T_{AFM} (Å)					*37.3*	*28.5*				

Table SI. Thickness of the different binary SAMs, prepared at various temperature and humidity conditions: measured by ellipsometry ($T_{ell.}$), and equivalent thickness deduced from island or hole or filament coverage measured by AFM (T_{AFM}) assuming a perfect phase separation between long and short molecules. Values highlighted in yellow exhibit a high discrepancy.