Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

SUPPLEMENTARY INFORMATION

Sliding of Drops on Mesoporous Thin Films

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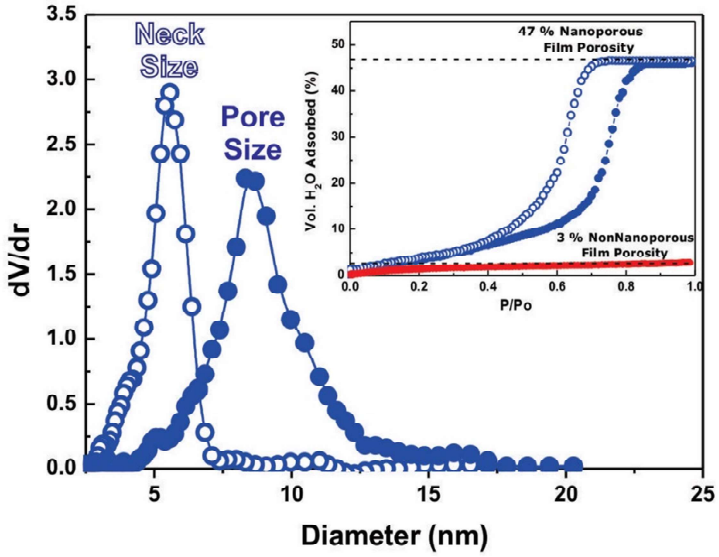

Figure S1: Nanoarchitecture of the nanoporous thin films used in this study. Typical pore size distribution and neck size distribution obtained by water adsorption-desorption isotherms at 298 K (see inset). Adsorption isotherm obtained from a non-nanoporous film is shown for comparative propose.

Adsorption/desorption isotherms were determined by environmental ellipsometricporosimetry (EEP) using a SOPRA GES5A apparatus, equipped with microspot optics, according to the protocols developed by Boissiere et. al. *Langmuir* 21, 12362-12371 (2005). Film thickness and the real component of the refractive index were obtained from the ellipsometric parameters $\psi(\lambda)$ and $\Delta(\lambda)$; the film refractive index was described according to a modified Cauchy equation. Pore size distributions were obtained from the analysis of the refractive index variation, using the WinElli 2 software which transforms the variation of n with P/P^o into filled pore volume by using a three-medium BEMA treatment. Pore and neck size distributions are derived according to a Kelvin model.

Table S1: Structural data obtained from ellipsoporosimetry of the films.

	Pore Size (nm)	Neck Size (nm)	Thickness (nm)	Porosity (%)
N-MTF	-----	-----	165 ± 1	3 ± 0.5
MTF	8.5 ± 1	5.5 ± 0.5	170 ± 1	47 ± 1

Table S2. Contact angle measurements for water and oil (Pfeiffer Vacuum GmbH) drops on the surfaces.

	Contact Angle (°) Water	Contact Angle (°) Oil
SSO	32 ± 1	21 ± 1
N-MTF	30 ± 1	22 ± 1
MTF	31 ± 2	20 ± 1

Table S3. Droplet base radius when water or oil (Pfeiffer Vacuum GmbH) are placed on the three surfaces.

Water	**Drop radius (mm) Vol = 15 µl**	**Drop radius (mm) Vol = 20 µl**	**Drop radius (mm) Vol = 30 µl**	**Drop radius (mm) Vol = 40 µl**
SSO	3.1 ± 0.2	3.4 ± 0.2	3.7 ± 0.2	4.4 ± 0.2
N-MTF	2.9 ± 0.2	3.5 ± 0.2	3.9 ± 0.2	4.2 ± 0.2
MTF	3.0 ± 0.2	3.3 ± 0.2	3.8 ± 0.2	4.3 ± 0.2
Oil	**Drop radius (mm) Vol = 15 µl**	**Drop radius (mm) Vol = 20 µl**	**Drop radius (mm) Vol = 30 µl**	**Drop radius (mm) Vol = 40 µl**
SSO	3.6 ± 0.2	4.1 ± 0.2	4.8 ± 0.2	5.3 ± 0.2
N-MTF	3.8 ± 0.2	4.4 ± 0.2	4.7 ± 0.2	5.1 ± 0.2
MTF	3.5 ± 0.2	4.2 ± 0.2	4.5 ± 0.2	5.0 ± 0.2

Table S4. Physicochemical properties of fluids at 25 °C.

Fluid	**Density**	**Viscosity**	**Surface tension**	**Capillary length**
	ρ [kg/m^3]	μ [Pa s]	γ [N/m]	λ [m]
Water	998	0.0009	0.073	0.0027
Oil (Pfeiffer)	870	0.0827	~0.025	~0.0017

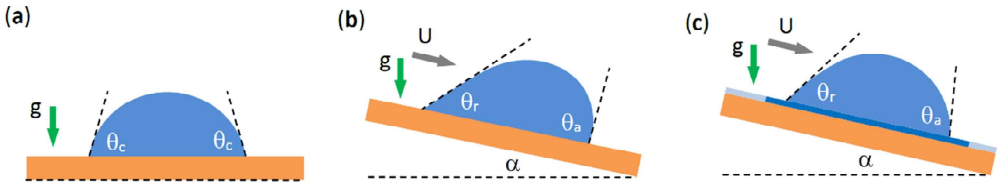

Figure S2. Schematic representation of droplets, where the contact angles illustrate the different pinning of surfaces. (**a**) Sessile droplet on a horizontal surface. (**b**) Sessile droplet on an inclined N-MTF surface. (**c**) Sessile droplet on an inclined MTF surface.

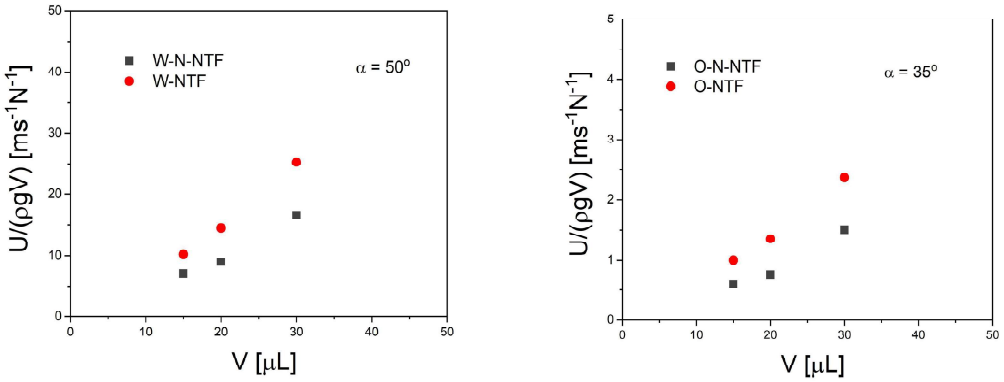

Figure S3. Droplet mobility (defined as the droplet velocity relative to the driving force) on different surfaces, as a function of the droplet volume, for water (left panel) and oil (right panel). The droplet velocity corresponds to that in Figure 5, where the surfaces were tilted 50° and 35° for the water and oil drops, respectively. The droplet mobility increases with the droplet volume, showing that the relationship U vs V in nonlinear for these systems.