Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Solution Processed High Refractive Index Contrast Distributed Bragg Reflectors

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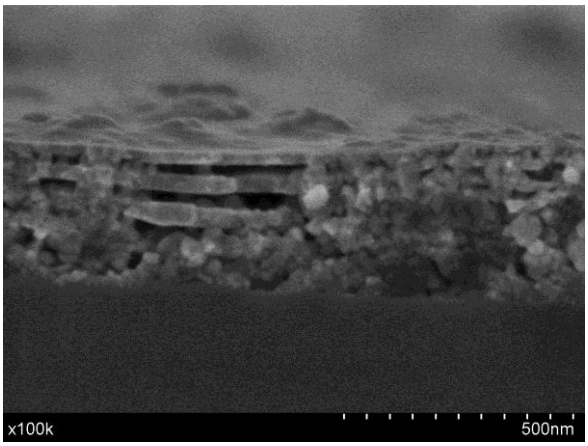

Figure S1. Cross section SEM image of a TiO_2/MgOF multilayer deposition

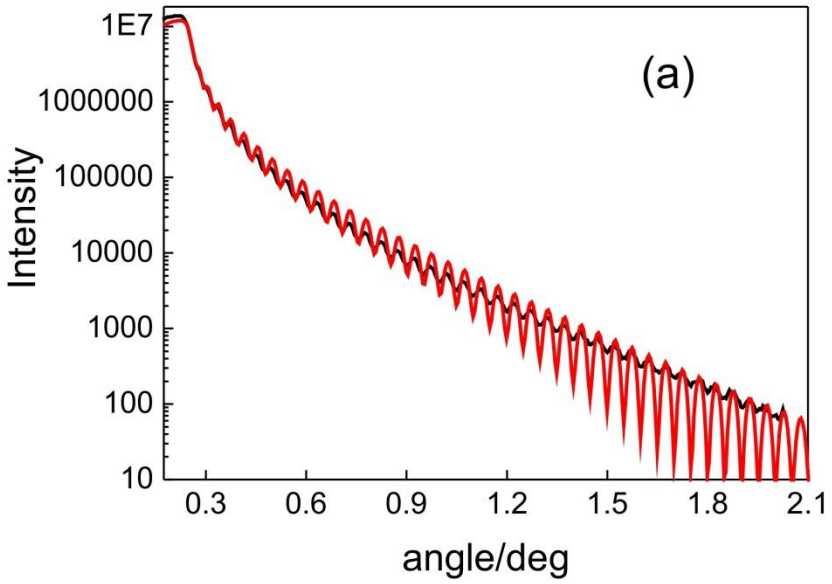

Figure S2 (a) TiO_2 layer XRR measurement (black solid line) and theoretical data fit (red solid line).

The density of TiO_2 layer was obtained by a theoretical fitting of the measured XRR data with X'Pert Reflectivity software. First, we estimate the thickness of TiO_2 layer using the Thickness Analysis mode in the same software. Thickness values were

compared with SEM images detecting differences that do not exceed 15%. Next, we fit XRR data using thickness as input. Roughness and density were kept free around certain limits. The formulae that are usually used to fit thickness and density with XRR are described below:

$$d = \frac{\lambda}{2\Delta\theta}$$

and

$$\theta_c^2 = \frac{4\pi r_0}{k_0} N_A \delta_m \frac{\sum c_j Z_j}{\sum c_j A_j}$$

being

d: thickness
λ: X-Ray wavelength
$\Delta\theta$: period of the oscillation measured in radians
θ_c: angle at which maximum intensity drops to its half, measured in radians
r_0:classical radius of an electron (2.818×10^{-15}m)
N_A: Avogadre Number
$k_0 = 2\pi/\lambda$
δ_m: density (g/cm^3)
c_j: fraction of j specie in the compound
Z_j *and* A_j: atomic number and atomic mass of the j element

From that point porosity (P) can be estimated by

$$P = 1 - \frac{\delta_f}{\delta_m}$$

being

δ_f: film density (g/cm^3)
δ_m: bulk density (g/cm^3)

It is worth to mention that fitting software is provided with a huge database that allows us to set TiO_2 and substrate parameters. Film density (δ_f) results from the fitting. Bulk density was obtained from different bibliography (see for instance Ref 45).

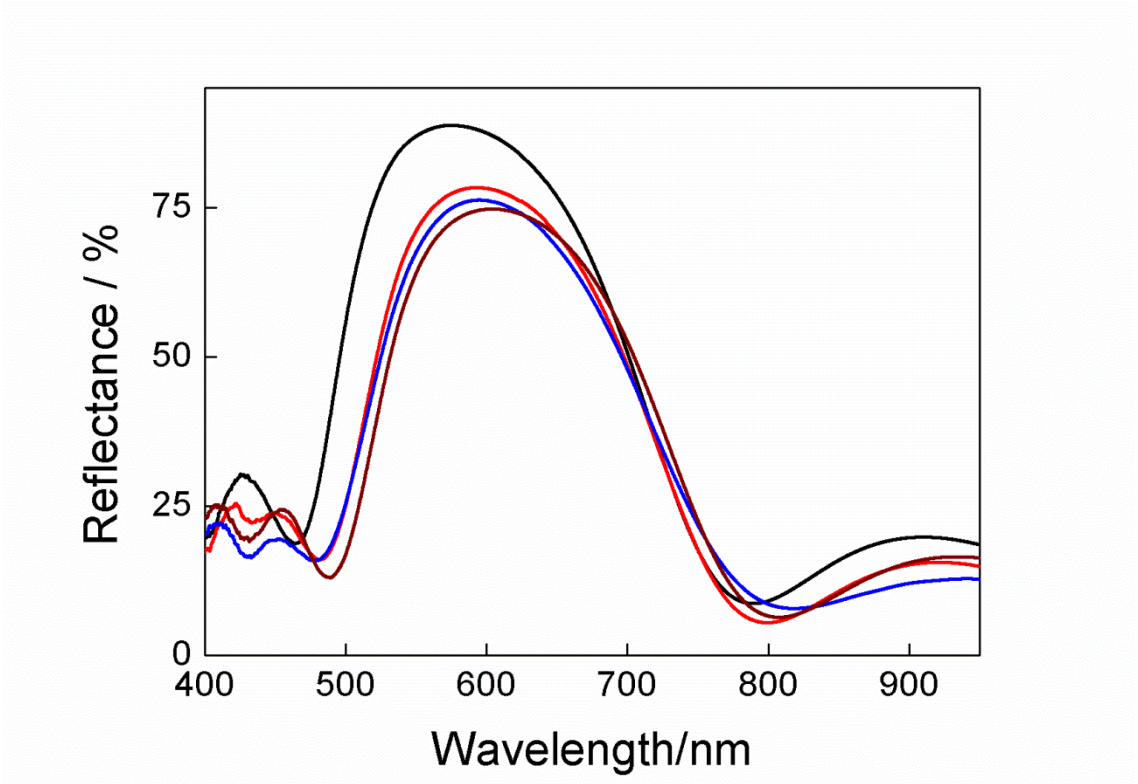

Figure S3. Reflectance spectra obtained before (black solid line) and after infiltration with acetone (red solid line) , isopropanol (blue solid line) and N,N-dimethylformamide (brown solid line)

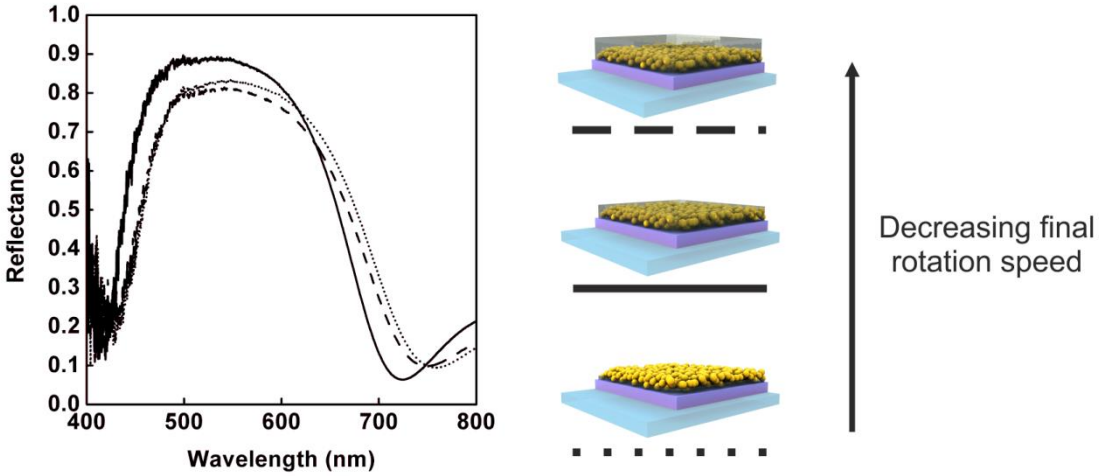

Figure S4. Reflectance spectra obtained for identical DBR infiltrated with a polystyrene solution with different final rotation speed (ω). Values of ω (in rpm) are: 2000 (dashed line), 3000 (solid line) and 4000 (dotted line).