

SUPPORTING INFORMATION

Routes towards catalytically active TiO₂ doped porous cellulose

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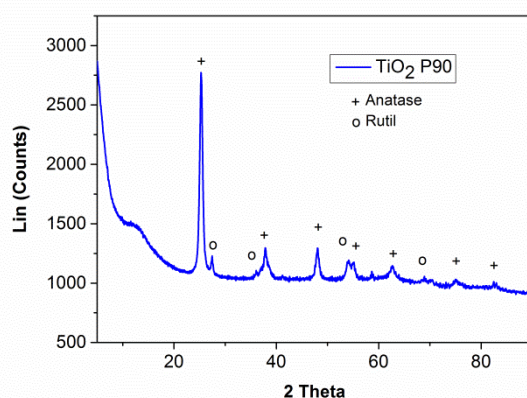


Figure SI-1. X-Ray diffraction pattern for the TiO₂ P90 (Evonik) powder

The following lattice parameters have been calculated using full width at half maximum (FWHM) and integral breadth (IB) methods:

- anatase: $a = 3.7873$ (5), 9.506 (1), $V = 136.36$ (4), size IB = 10 nm, size FWHM = 14 nm, density = 3.89 g/cm^3

- rutil: $a = 4.596$ (1), 2.958 (9), $V = 62.4$ (1), size IB = 12 nm, size FWHM = 17 nm, density = 4.27 g/cm^3

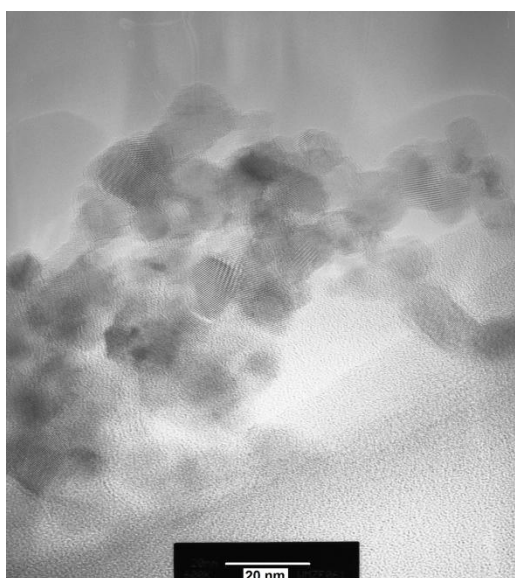


Figure SI-2. Transmission electron micrograph for the TiO₂ P90 (Evonik) powder

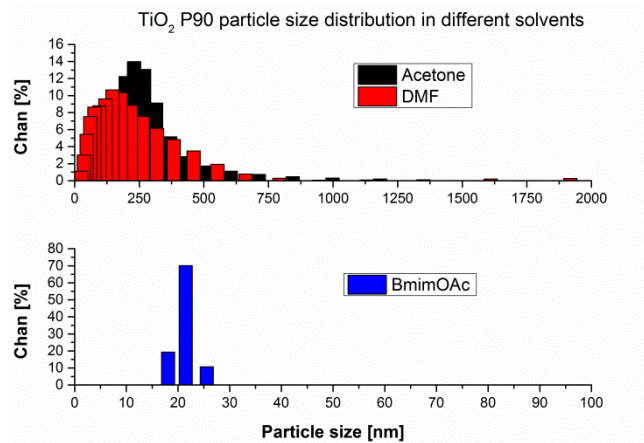


Figure SI-3. TiO₂ P90 (Evonik), 2.5 wt%: Particle size distribution in different solvents estimated by DLS

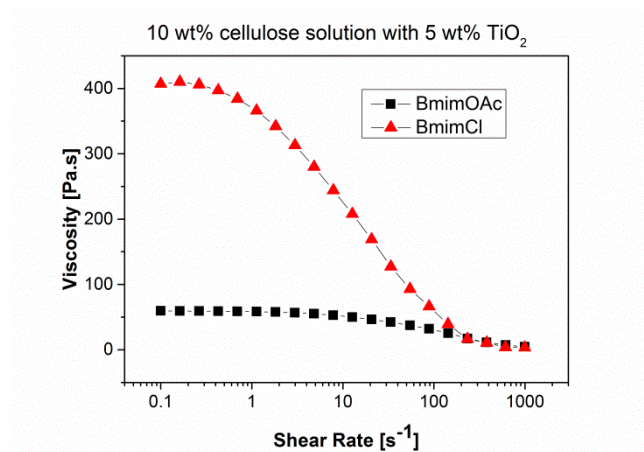


Figure SI-4. Viscosity dependence of the shear rate for 5 wt% TiO₂ Aldrich (relative to polymer) doped cellulose (10 wt%) solutions in two ionic liquids

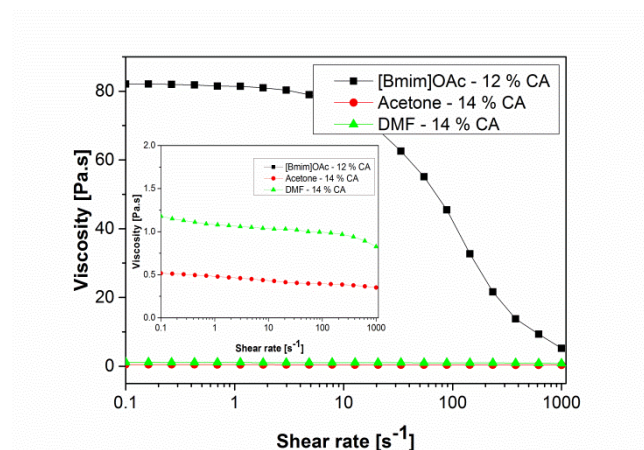


Figure SI-5. Viscosity dependence of the shear rate for cellulose acetate (12 or 14%) solutions in different solvents

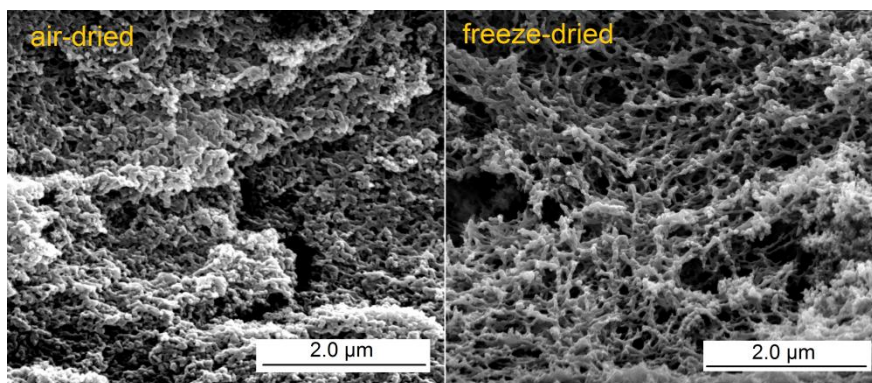


Figure SI-6. Scanning electron microscopy images of TiO_2 CA films prepared from BmimOAc: Effect of different drying methods

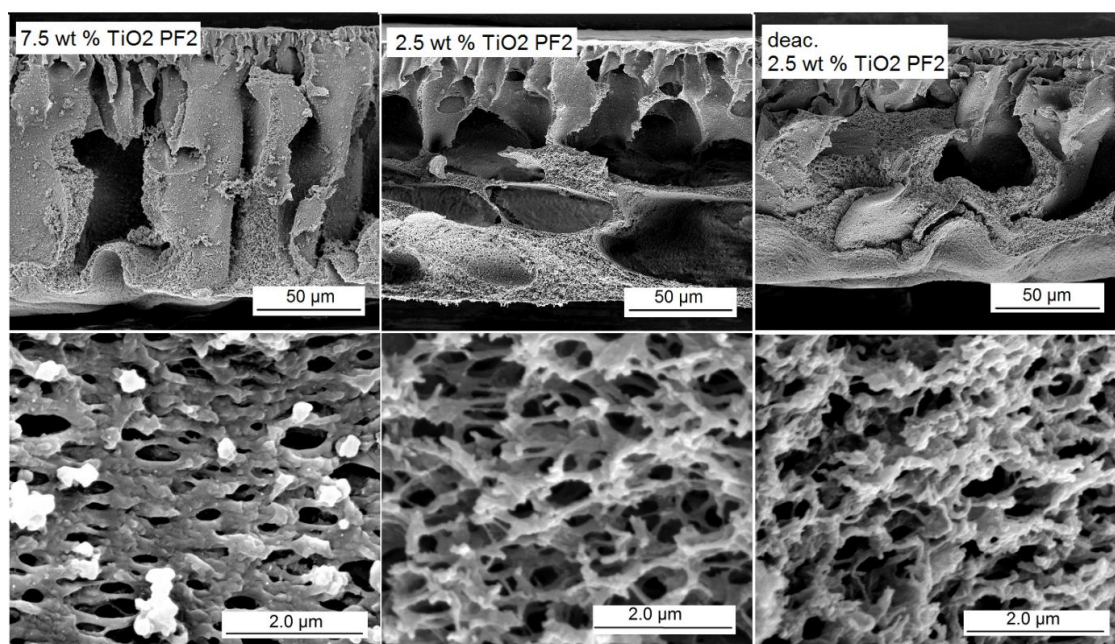


Figure SI-7. Cellulose acetate – TiO_2 PF2 and corresponding cellulose membranes prepared from DMF solutions

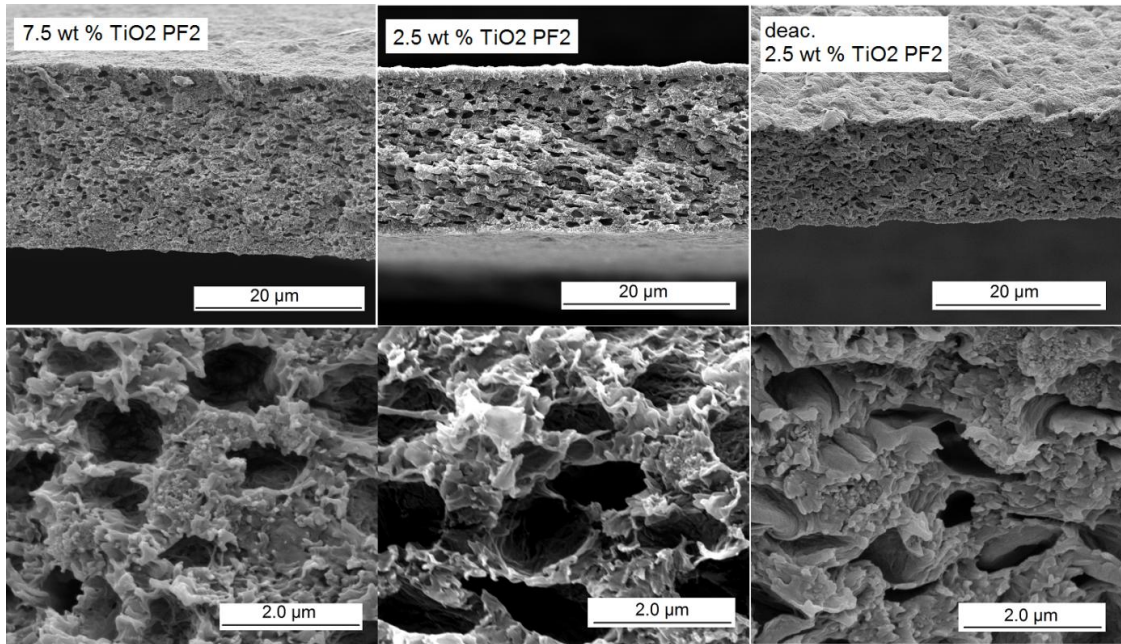


Figure SI-8. Cellulose acetate – TiO₂ PF2 and corresponding cellulose membranes prepared from acetone solutions

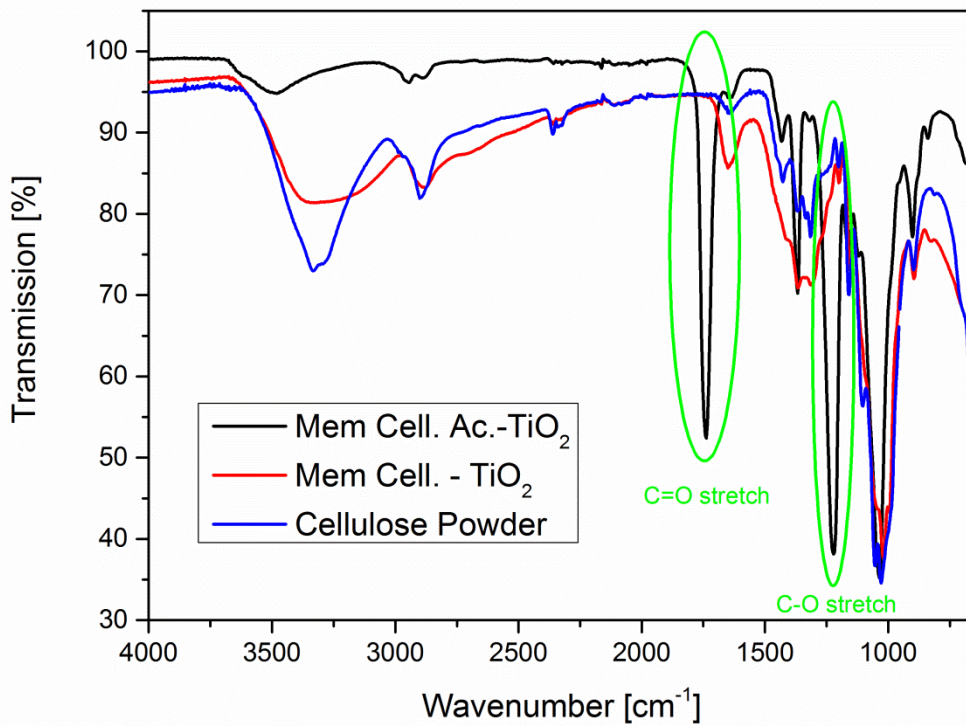


Figure SI-9. FT-IR ATR spectra of cellulose acetate – TiO₂ membrane (Aldrich), of the deacetylated cellulose acetate – TiO₂ (Aldrich) membrane and of the commercial cellulose

Additional activity tests:

Membrane pieces of $2 \times 2 \text{ cm}^2$ were impregnated with 10^{-5} M organic dyes in water: each membrane piece was immersed in 50 ml of dye solution and was maintained there in dark conditions for 30 min. The membrane pieces after removal from dye solution were placed in an open crystallizing dish and exposed to the UV radiation (365 nm) in a TLC CN-15 viewing cabinet from Vilber Lourmat GmbH with 2 x 15 W lamps and intensity at the bottom of $1050 \mu\text{W}/\text{cm}^2$. Digital pictures have been taken before UV exposure and after specific periods of time (Test 1). For cellulose acetate based composite membranes pieces of $2 \times 2 \text{ cm}^2$ were imbued with 10^{-5} M organic dyes in water by immersion in 50 ml solutions.

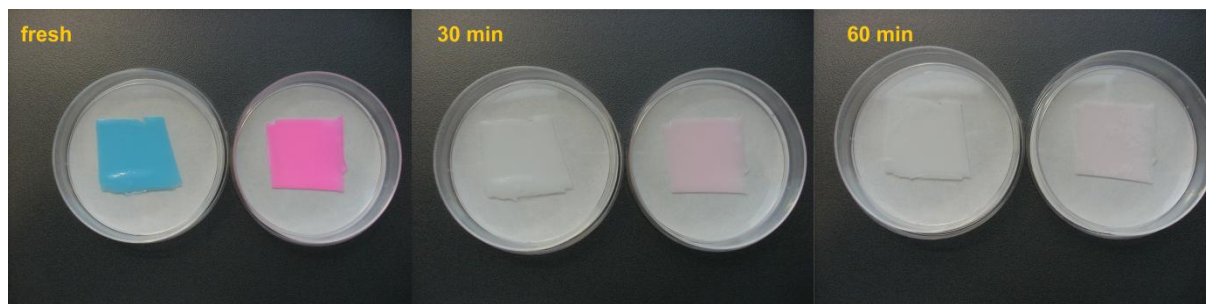


Figure SI-10 Photocatalytic degradation of methylene blue and rhodamine B on cellulose acetate – TiO_2 P90 (ratio: 10:1) nanocomposite films obtained from DMF solution