Immobilization of TiO_2 Semiconductor Nanoparticles onto Posidonia oceanica fibers for photocatalytic phenol degradation

Latifa Morjène [1,2], Michael Schwarze [2], Reinhard Schomäcker [2], Mongi Seffen [1], and Minoo Tasbihi [2,*]

[1]Laboratory of Energy and Materials (LABEM), High School of Sciences and Technology of Hammam Sousse, Sousse University-Tunisia, Hammam, 4011, Hammam Sousse, Tunisia; morjene.latifa@gmail.com (L.M.); mongiseffen@yahoo.fr (M.S.)

[2]Technische Universität Berlin, Institut für Chemie, TC 8, Straße des 17. Juni 124, 10623 Berlin, Germany; mi-chael.schwarze@tu-berlin.de (M.S); schomaecker@tu-berlin.de (R.S.);

***corresponding author:** Minoo Tasbihi **(**minoo.tasbihi@tu-berlin.de)

Figure S1 shows the different steps for the synthesis of the POF/TiO2 composite photocatalysts. For more details about the procedure see experimental part in the main text.

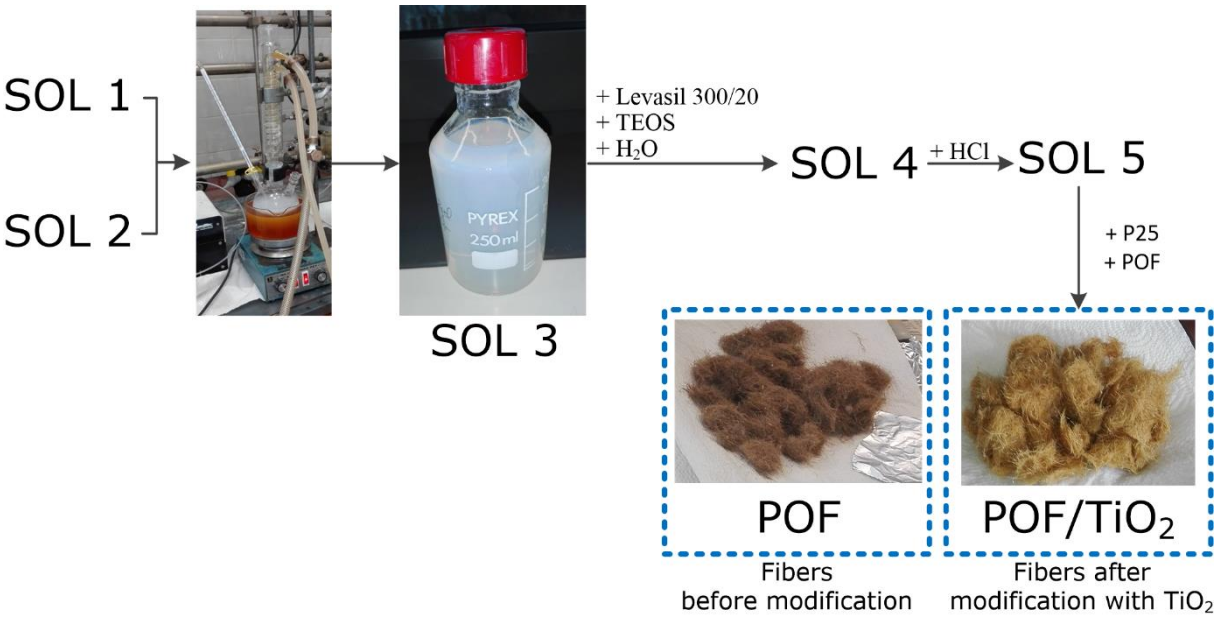

Figure S1. Schematic process of POF/TiO_2 synthesis.

Figure S2 shows a scheme for photocatalytic phenol degradation with POF/TiO_2 composite photocatalysts.

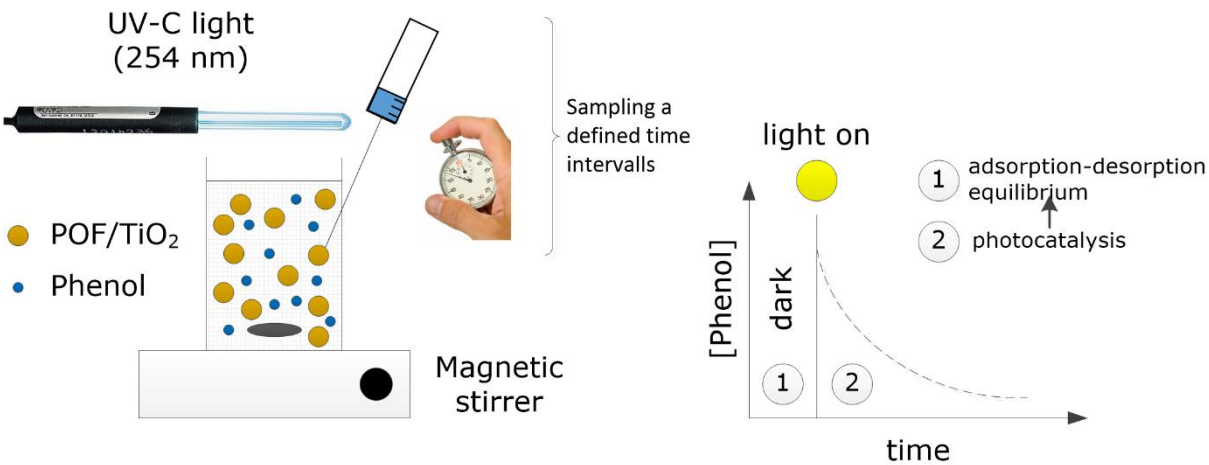

Figure S2. Scheme for the photocatalytic degradation of phenol using POF/TiO_2.

Figure S3 shows typical HPLC chromatograms for phenol degradation. The HPLC method is given in the main text and the phenol peak appears at about 3.1 min. With increasing irradiation time, the phenol peak decreases and side products at lower retention times might occur.

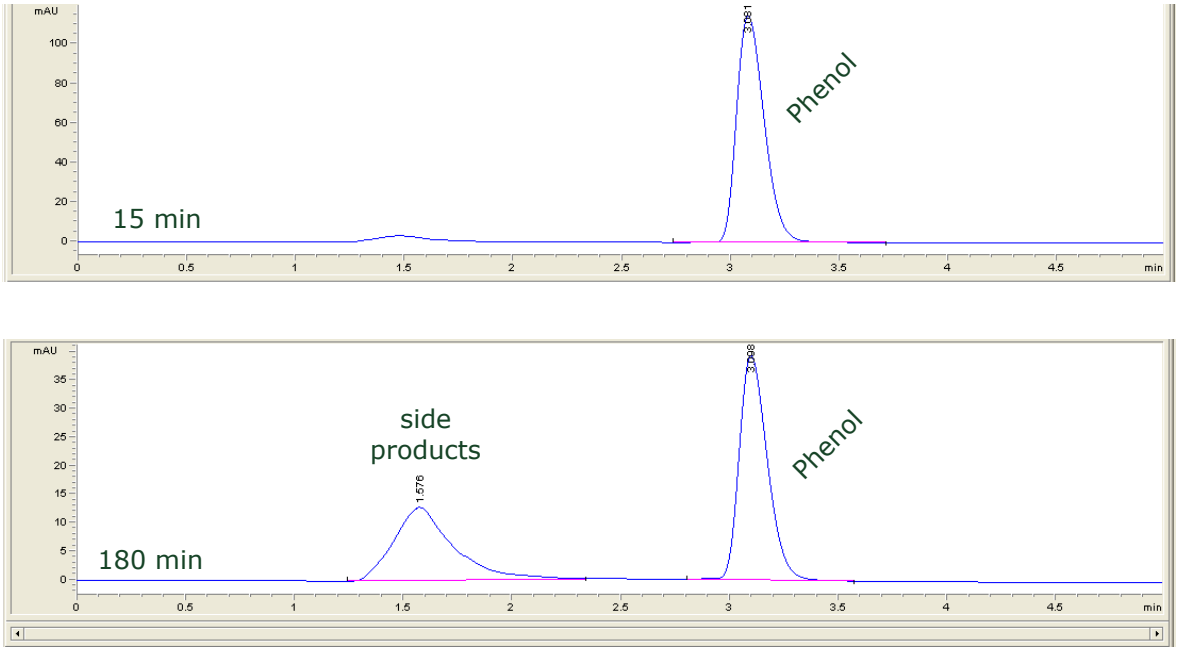

Figure S3. HPLC chromatograms after short and long time irradiation of phenol.

Figure S4 shows the EDX spectra of the pure fibers and after modification with TiO_2. The successful modification is verified by the Ti signal in the EDX spectrum after sol-gel synthesis.

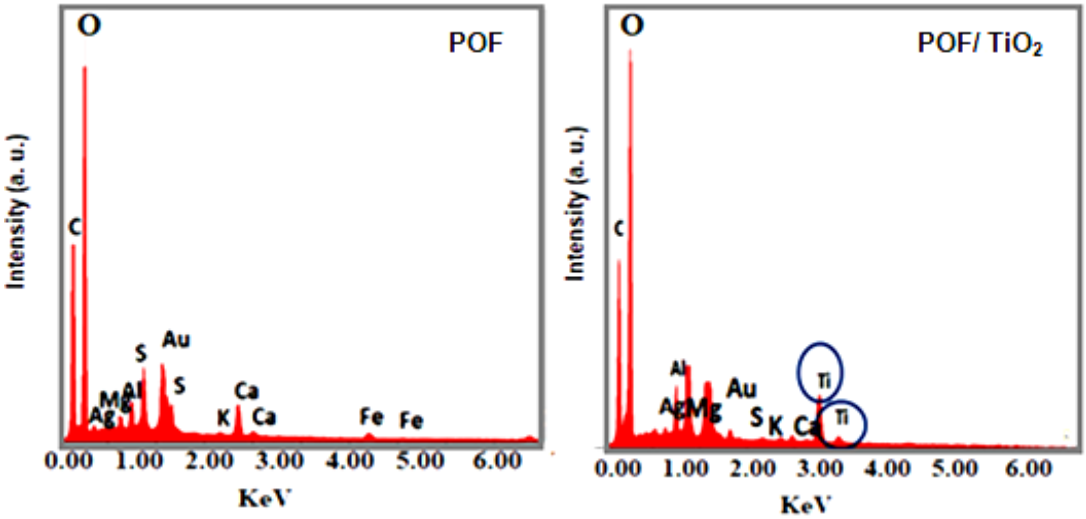

Figure S4. EDX spectra of POF (left) and POF/TiO_2 (right).

Figure S5 shows the adsorption isotherm of the POF/TiO_2 composite as well as the adsorbed nitrogen volume for the fibers and the POF/TiO_2 composite. After modification with TiO_2, the BET surface area and the adsorbed volume are increased in comparison to the pure fibers.

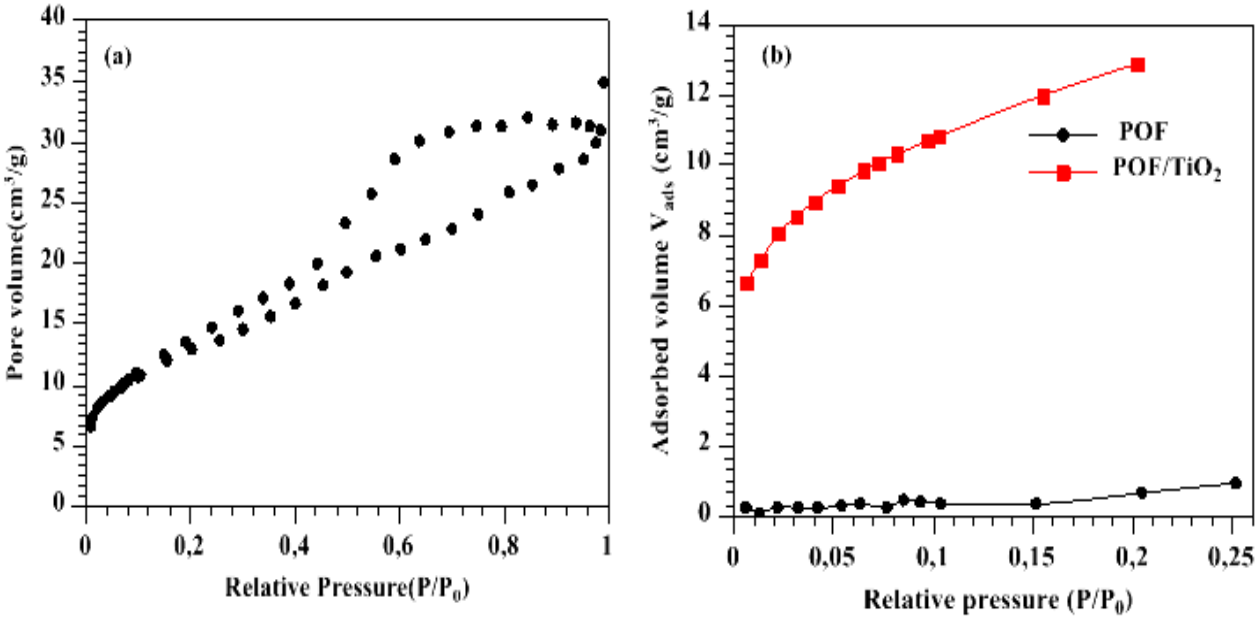

Figure S5. N_2 adsorption isotherms for POF/TiO_2 (a), and adsorbed N_2 volume for POF and POF/TiO_2 (b).