Supplementary Material (ESI) for Chemical Communications

Supplementary Information

Novel one step hydrothermal synthesis of TiO_2/WO_3 nanocomposites with enhanced photocatalytic activity

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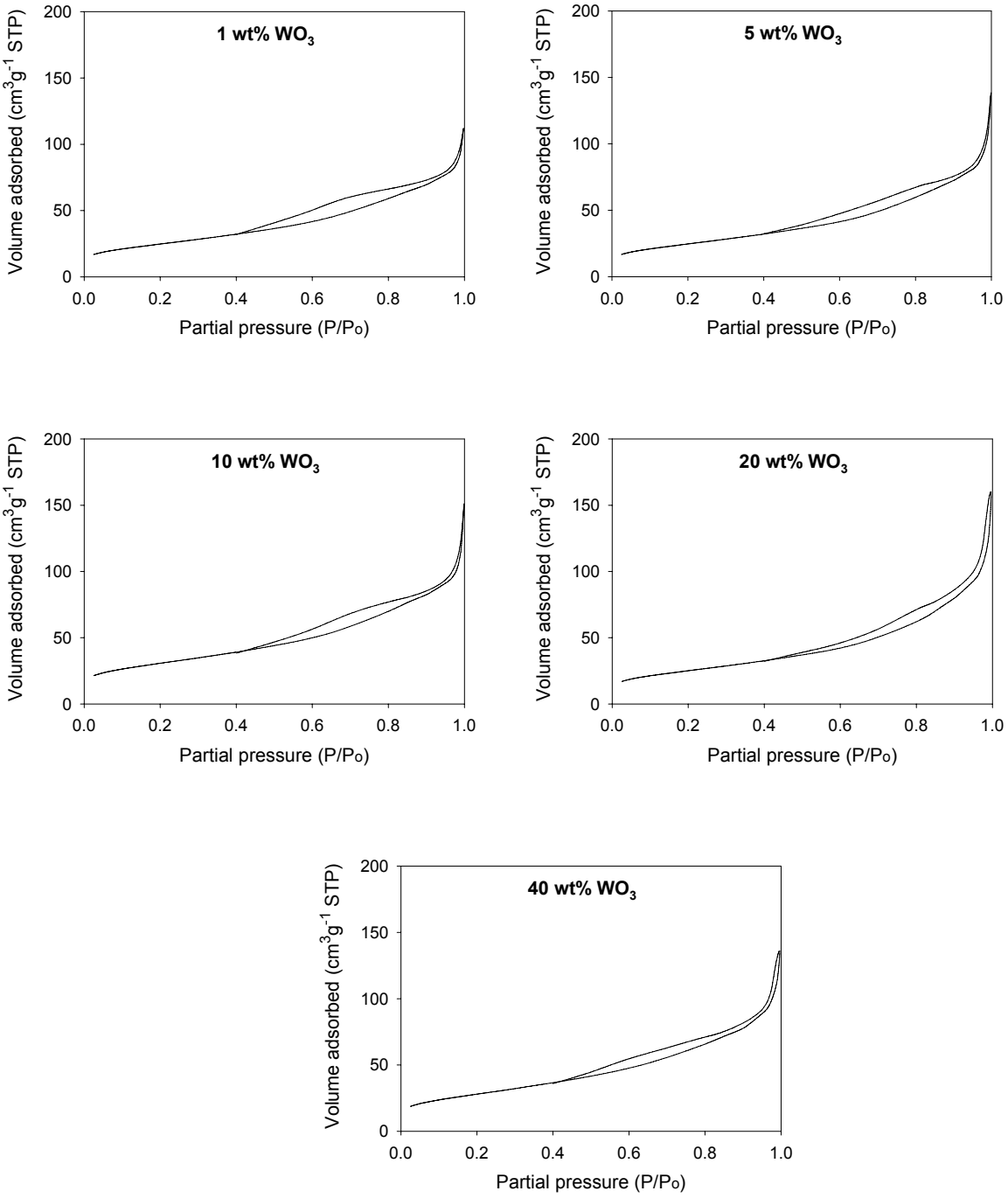
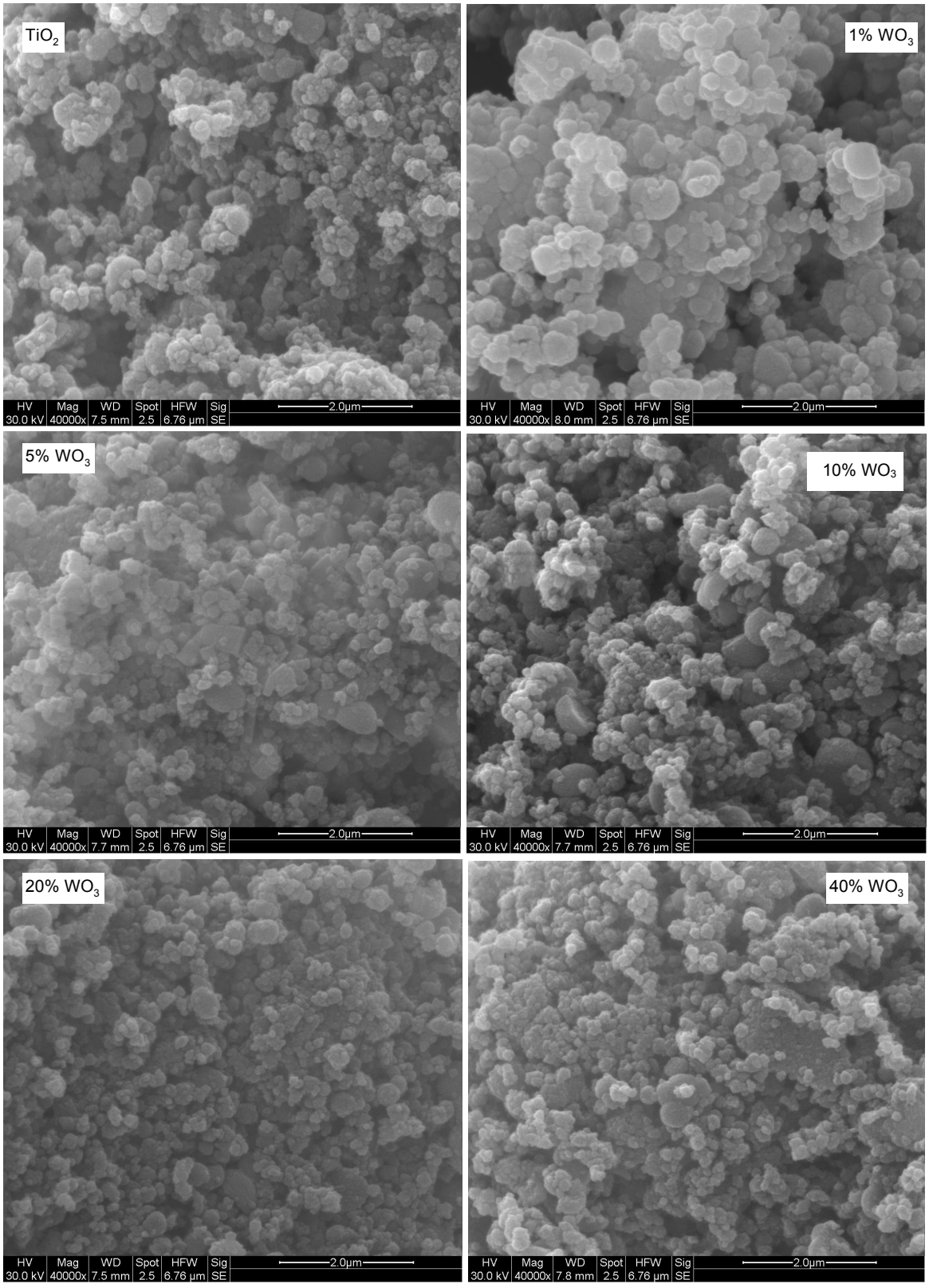
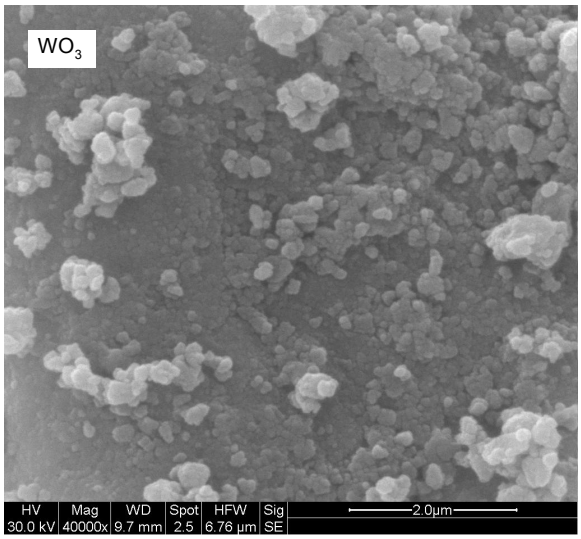


Supplementary Figure S1. Nitrogen sorption isotherms of TiO_2/WO_3 nanocomposites.

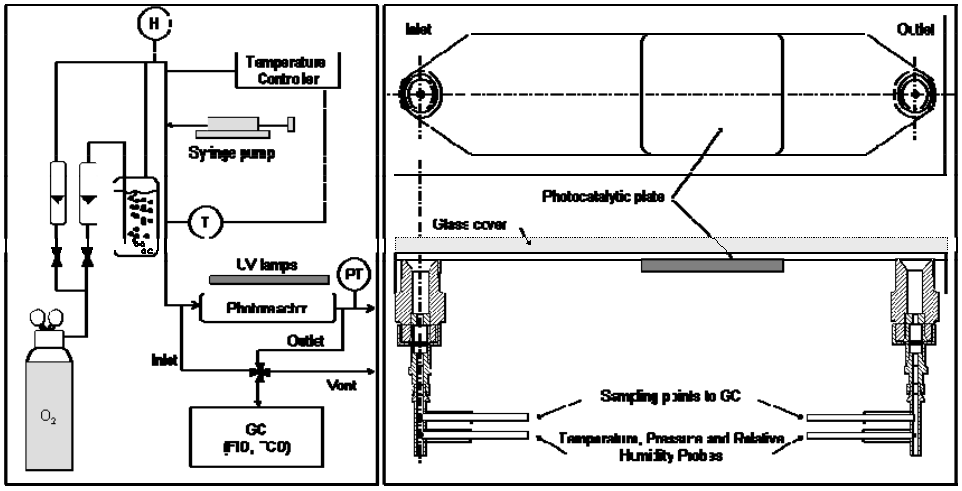




Supplementary Figure S2. SEM images of pure TiO_2 and WO_3 oxides and mixed oxide TiO_2/WO_3 nanocomposites.

Description of photocatalytic reactor

Figure 3 presents planar and side views of the photocatalytic reactor. It consisted of a flat 75 mm-wide, 600 mm-long, stainless steel reactor that allowed the controlled distribution of the contaminated air flow over the catalyst. A 75 mm × 100 mm glass plate coated with the photocatalyst was located 270 mm from the inlet of the reactor and 170 mm from the outlet. The reactor was covered with a borosilicate glass (7.7 mm thick) sealed with a Viton gasket. This formed a 75 mm × 2.5 mm flow passage across the whole length of the reactor. The reactor inlet and outlet were designed to minimize back-flow dispersion and to achieve uniform, fully-developed flow before reaching the photocatalytic plate. The reactor was irradiated with five blacklight blue fluorescent lamps (Philips TL 8W/08 F8T5/BLB, 0.0155 m bulb diameter, 0.26 m bulb length and 1.2 W UV-A output). The lamp emitted a minute fraction of the total radiation at 324 and 325 nm and the the rest between 343 nm and 400 nm with a maximum irradiance peak at 365 nm. The centerlines of the lamps were separated by 0.039 m. The radiation intensity at the photocatalytic surface was regulated by changing the number of lamps switched on (1, 3 or 5) and by adjusting the distance between the lamps and the reactor.



Supplementary Figure S3. Planar and side views of the flat-plate photocatalytic reactor (right). Experimental set-up for the photocatalytic oxidation experiments (left).