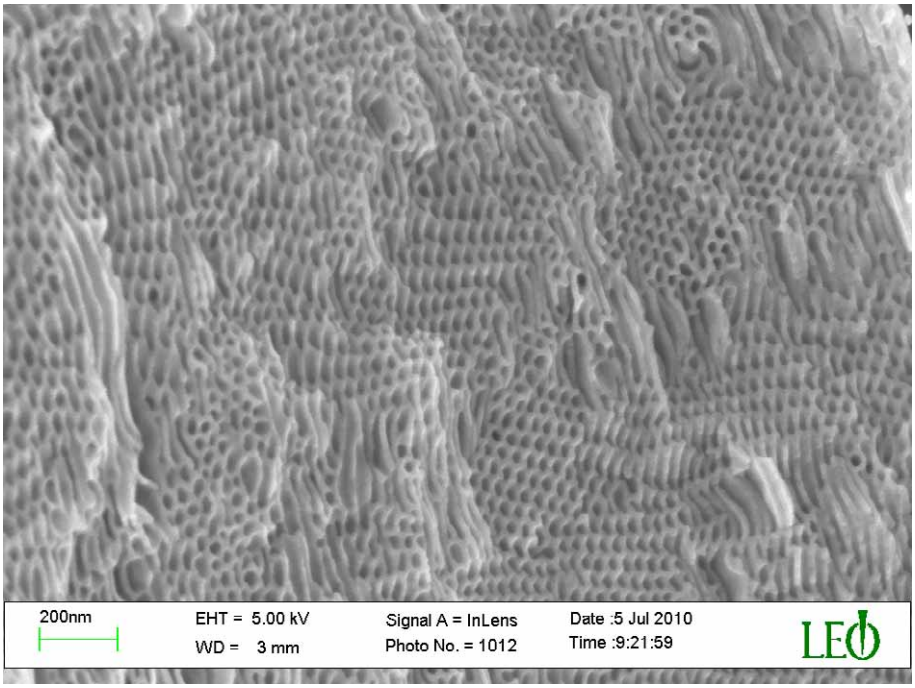
Supporting information for manuscript:

Enhanced photocatalytic properties in well-ordered mesoporous WO_3
L. Li et al

Figure 1: SEM images of samples synthesised with ratios 1:1 and 1.25:1, taken after photocatalytic reaction. These images clearly document that the well-ordered mesoporous structure, predominantly made of cylindrical pores, has been preserved upon immersing in water, indicating a mechanically stable architecture.



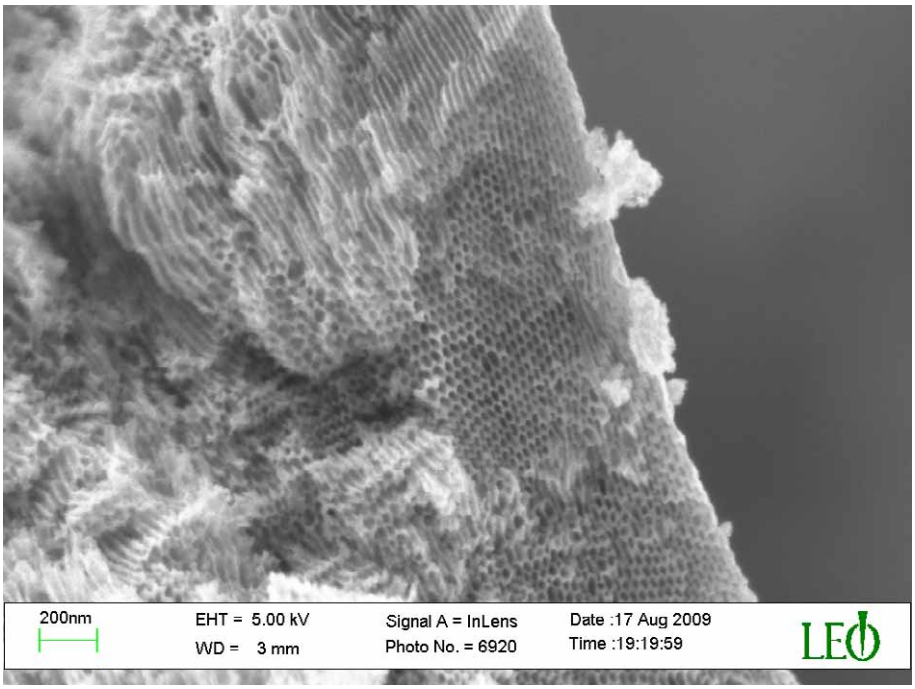


Figure 2: Pore size distribution of the sample produced without polymer template (used as the reference sample in the manuscript). This distribution is also shown in Figure 2a of the manuscript; here it is enlarged and shows a small peak with a maximum at about 3-4 nm. This value was chosen for calculating diffusivity losses in the reference sample, which amass to a loss of more than 50%, due to significant pore diffusion limitations.

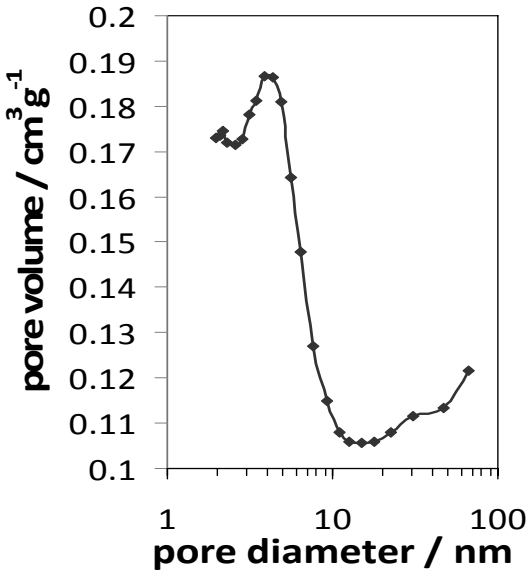


Figure 3: The mechanistic model proposed by Houas *et al* [1] for the photodegradation of methylene blue. In general, methylene blue presumably adsorbs on the WO_3 surface via its cationic sulphur group, which is first oxidised to the sulfoxide (causing the C-N activation in its middle ring) and then further via the sulfone to the final products, such as CO_2, nitrates, sulfates and ammonium ions.

It is important to mention that there is currently a debate whether methylene blue is a suitable test reagent for assessing the photocatalytic activity of metal oxide semiconductors [2-4]. However, the aim for this work was to design and compare various mesoporous architectures and to study their effect on photocatalytic properties. We believe that our observations are also valid for other, more dedicated dyes.

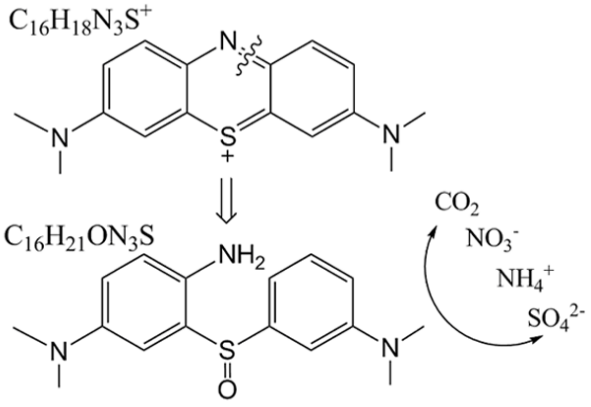
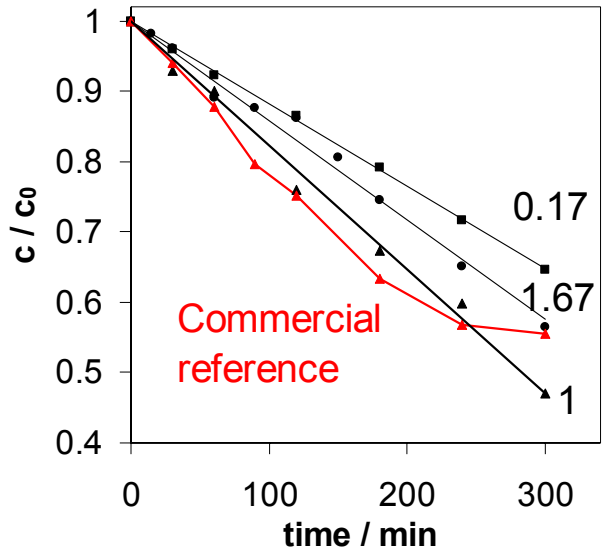


Figure 4: Decrease in MB concentration versus time under visible light: comparison of mesoporous samples and a nano-sized commercial powder, which is highly dispersible in water and thus possesses no apparent diffusion limitations. This sample was used as an alternative reference and showed similar activity as the mesoporous samples. This confirms that the diffusion limitation is dramatically reduced in the mesoporous samples.



References:

1 A. Houas, H. Lachheb, M. Ksibi, E. Elaloui, C. Guillard, J.-M. Herrmann, *Appl. Catal. B: Environ.*, 2001, **31**, 145.)
2 A. Mills and J. Wang, *J. Photoch. Photobio. A*, 1999, **127**, 123.
3 X. Yan, T. Ohno, K. Nishijima, R. Abe and B. Ohtani, *Chem. Phys. Lett.*, 2006, **429**, 606.
4 M. Mrowetz, W. Balcerski, A. J. Colussi and M. R. Hoffmann, *J. Phys. Chem. B*, 2004, **108**, 17269.