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Electronic supplementary information

The Degradation Mechanism of Methyl Orange Under Photo-Catalysis of TiO_2

Lihong Yu,[a] Jingyu Xi,[b] Ming-De Li,[a] Hungtat Chan,[a] Tao Su,[a] David Lee Phillips,*[,a] and Wai-Kin Chan*[,a]

[a]*Department of Chemistry, The University of Hong Kong, Pokfulam Road, Hong Kong, P. R. China, E-mail: phillips@hku.hk and waichan@hku.hk*
[b]*Lab of Advanced Power Sources, Graduate School at Shenzhen, Tsinghua University, Shenzhen, P. R. China.*

Fig. S1 UV-Vis absorption spectrum (dot profile) and fluorescence emission spectrum (solid profile) for MO in water 10^{-4} M.

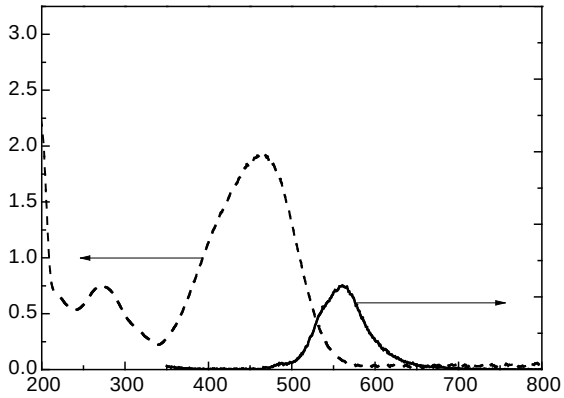
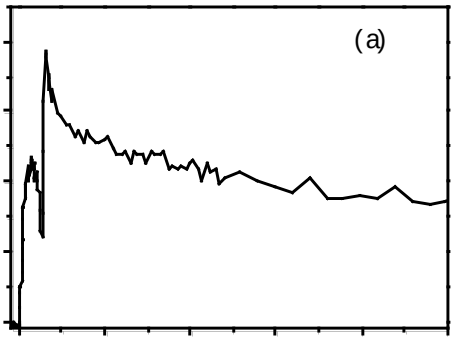


Fig. S2 (a) TA Decay profile of TiO_2 bulk film in MO MeCN solution. (b) TA Decay profile of MO solution in MeCN. Pump by 267 nm, probe at 675nm.



Description of the method used to obtain the TA decay profile of TiO_2 holes in MO solution (i.e. the enhanced solid profile in Fig. 7) investigated in the paper.

As mentioned in the body text, MO has a weak transient absorption at 675 nm whose onset and maximum are at 0.7 ps and 2.3 ps, earlier than the TA onset time (3.0 ps) of the bulk TiO_2 film. In order to get rid of the TA contribution from MO, the TA decay values of the bulk TiO_2 film in MO solution should be subtracted by the MO TA decay values scaled by an appropriate factor. In Fig. S2 (a), the TA peak at about 2.3 ps corresponds to the TA of MO which appears in Fig. S2 (b), and the TA peak at about 3.5 ps corresponds to the TA of TiO_2 holes. In order to obtain the TA decay profile of bulk TiO_2 film in MO solution (i.e. the enhanced solid profile in Fig. 7), Delta OD values in Fig. S2 (a) need to be subtracted by Delta OD values in Fig. S2 (b) scaled by 0.69.