Factors influencing the photocatalytic activity of rutile TiO\textsubscript{2} nanorods with different aspect ratios for dye degradation and Cr(VI) photoreduction

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Scheme S1 Formation of fluorescent product umbelliferone by the reaction of coumarin probe molecules with OH radicals.
Fig. S1 TEM images (left) and corresponding histograms of particle width (red) and length (blue) (right) of (a) NR-4, (b) NR-5, (c) NR-6, (d) NR-7, and (e) NR-8 prepared without polymer.
Fig. S2 Photocatalytic evolution of the concentration ($C/C_0$) of (a) MB degradation and (b) Cr(VI) reduction using samples NR-4–8 without polymer.
Fig. S3 Degradation of MB with recycled NR-4 and reduction of Cr(VI) with recycled NR-7.
Fig. S4 Correlations between (a) $k$ and $r_{\text{asp}}$; (b) $k$ and $E_{\text{fb}}$ of samples NR-4–8 for photocatalytic MB degradation and Cr(VI) reduction.
Fig. S5 Mott-Schottky plots obtained at different frequencies for the TiO$_2$ film electrodes prepared with samples NR-4–8 without polymer (TiO$_2$ film / Saturated Calomel / Pt in 0.1 M KCl) and their UV-Vis diffuse reflectance spectra (corresponding plots of $(a\nu)^2$ verse energy $\nu$ for samples NR4–8 inserted).
Fig. S6 TEM images (left) and corresponding histograms of particle width (red) and length (blue) (right) of samples NR-4 (a) without polymer (b) with 10 mg PVA (c) with 20 mg PVA (d) with 10 mg PVP (e) with 20 mg PVP.
**Fig. S7** Photocatalytic evolution of the concentration ($C/C_0$) of MB degradation and Cr(VI) reduction using NR-4 samples synthesized without polymer and with different amounts of PVA / PVP.
**Fig. S8** Mott-Schottky plots obtained at different frequencies for the TiO$_2$ film electrodes prepared with samples NR-4 with different amounts of PVA / PVP (TiO$_2$ film / Saturated Calomel / Pt in 0.1 M KCl).
Fig. S9 Correlations between (a) (c) $k$ and $r_{asp}$; (b) (d) $k$ and $E_{fb}$ of samples NR-4 without polymer and with different amounts of PVA or PVP for photocatalytic MB degradation and Cr(VI) reduction.
Fig. S10 (a) Photocatalytic evolution of the concentration ($C/C_0$) and (b) rate constants ($k$) for the initial 30 min of photocatalytic Cr(VI) reduction using sample NR-4 with PVA-10 and the Degussa P25 ($S_{\text{BET}}=51.67$ m$^2$ g$^{-1}$).