

**Factors influencing the photocatalytic activity of rutile TiO<sub>2</sub> nanorods with  
different aspect ratios for dye degradation and Cr(VI) photoreduction**

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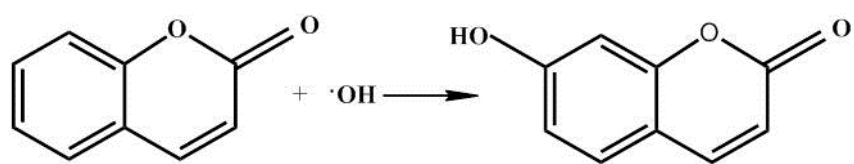
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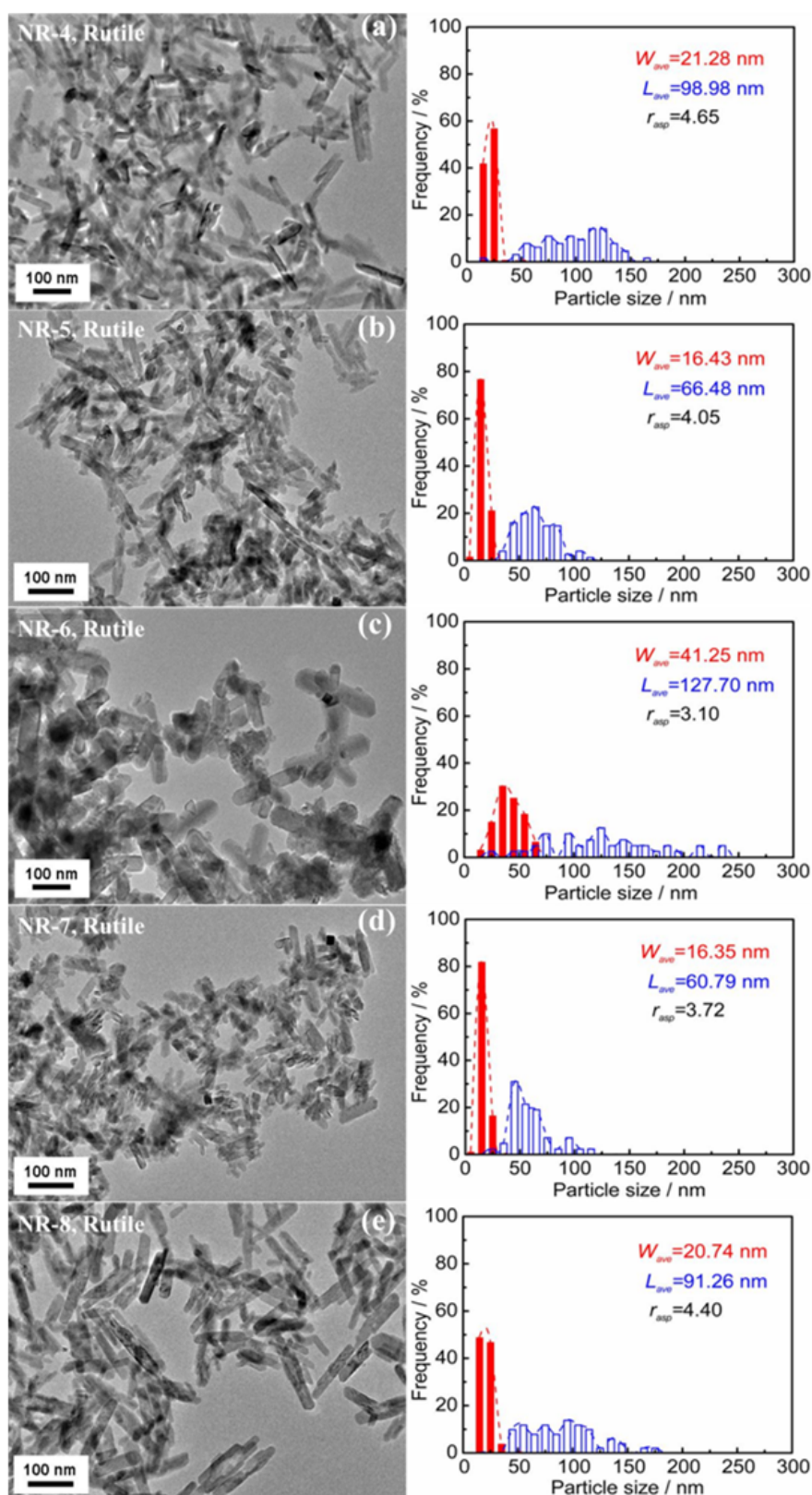
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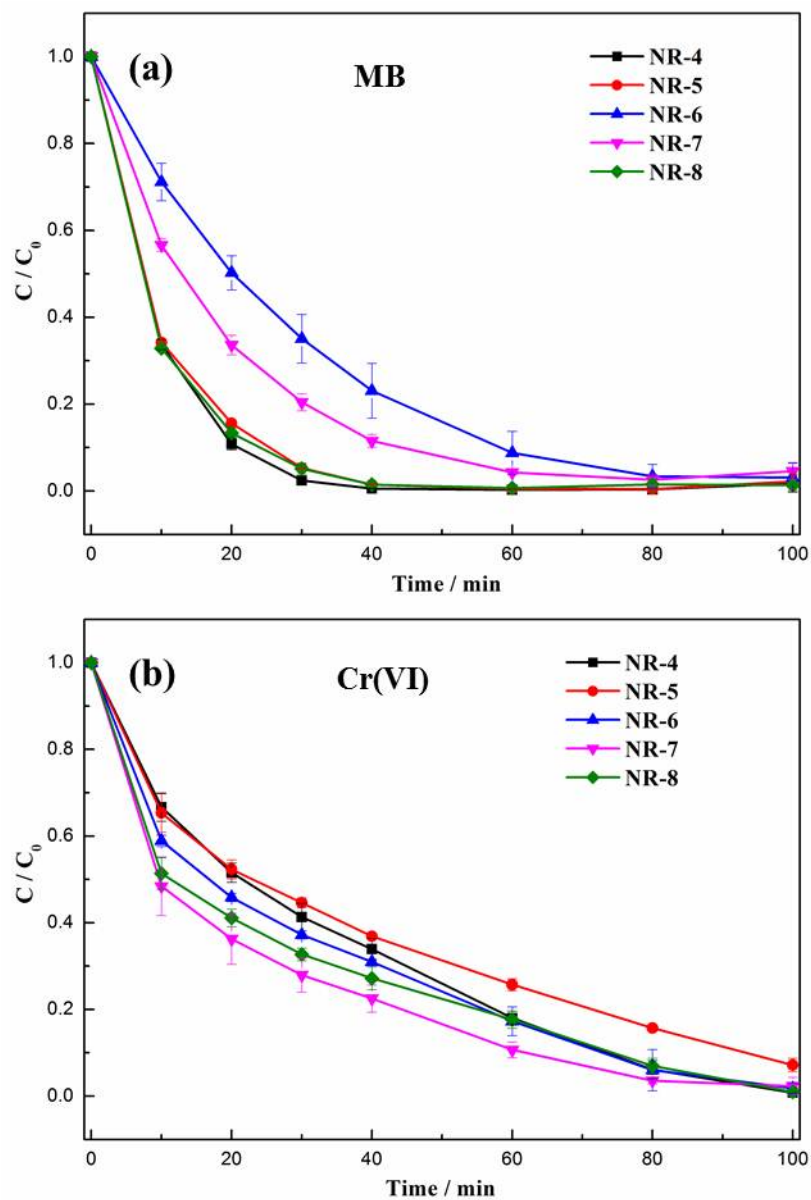
**Scheme S1** Formation of fluorescent product umbelliferone by the reaction of coumarin probe molecules with OH radicals.



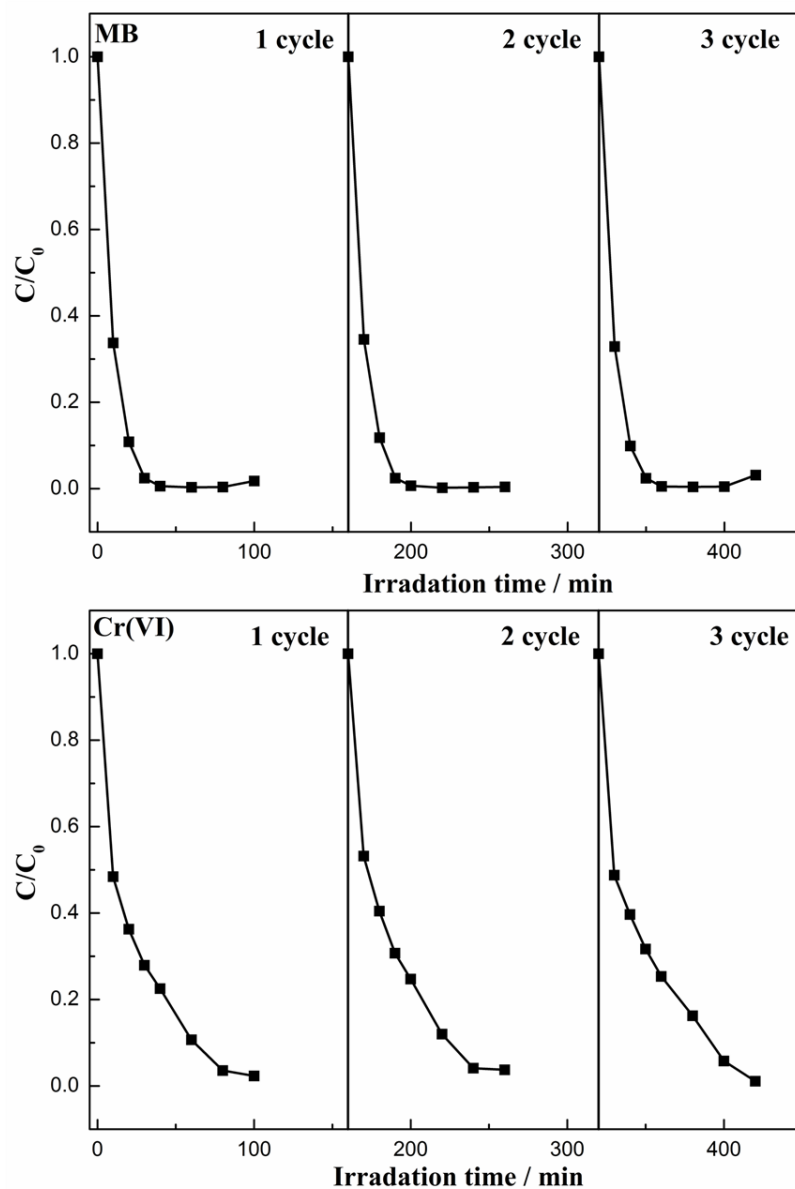
**Fig. S1** TEM images (left) and corresponding histograms of particle width (red) and

length (blue) (right) of (a) NR-4, (b) NR-5, (c) NR-6, (d) NR-7, and (e) NR-8

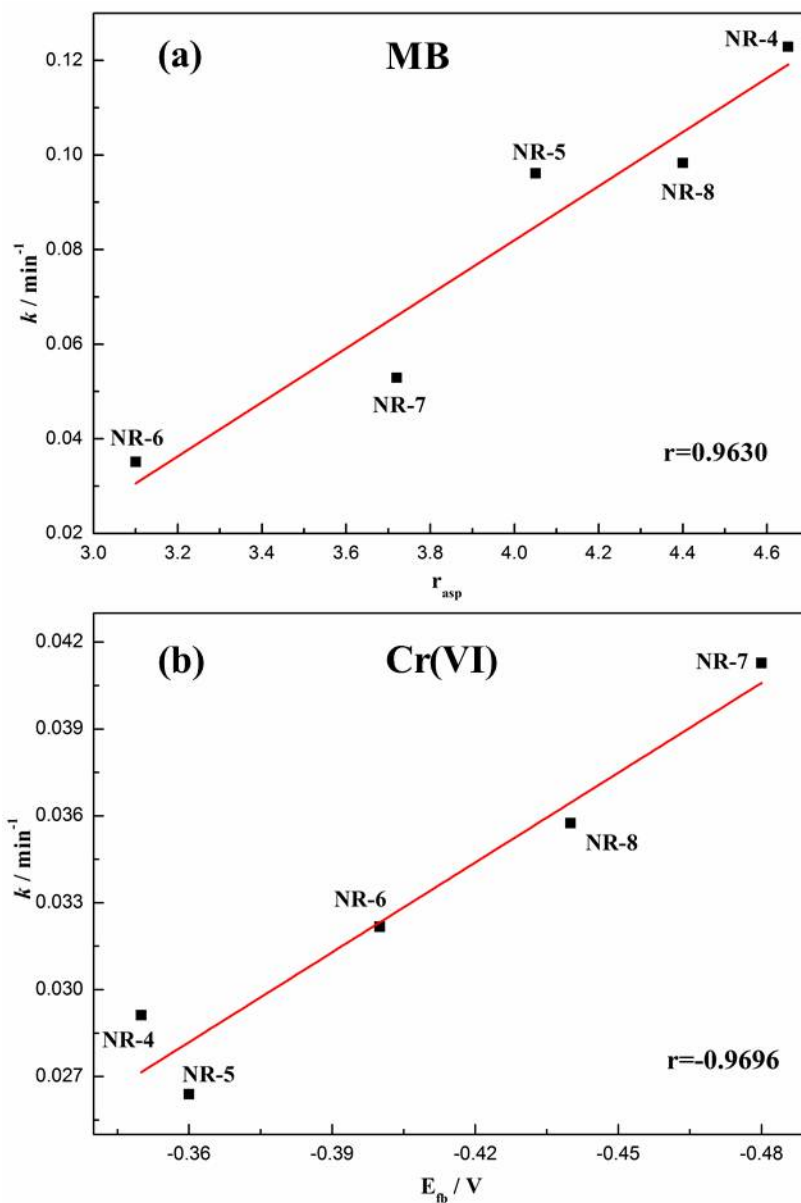
prepared without polymer.



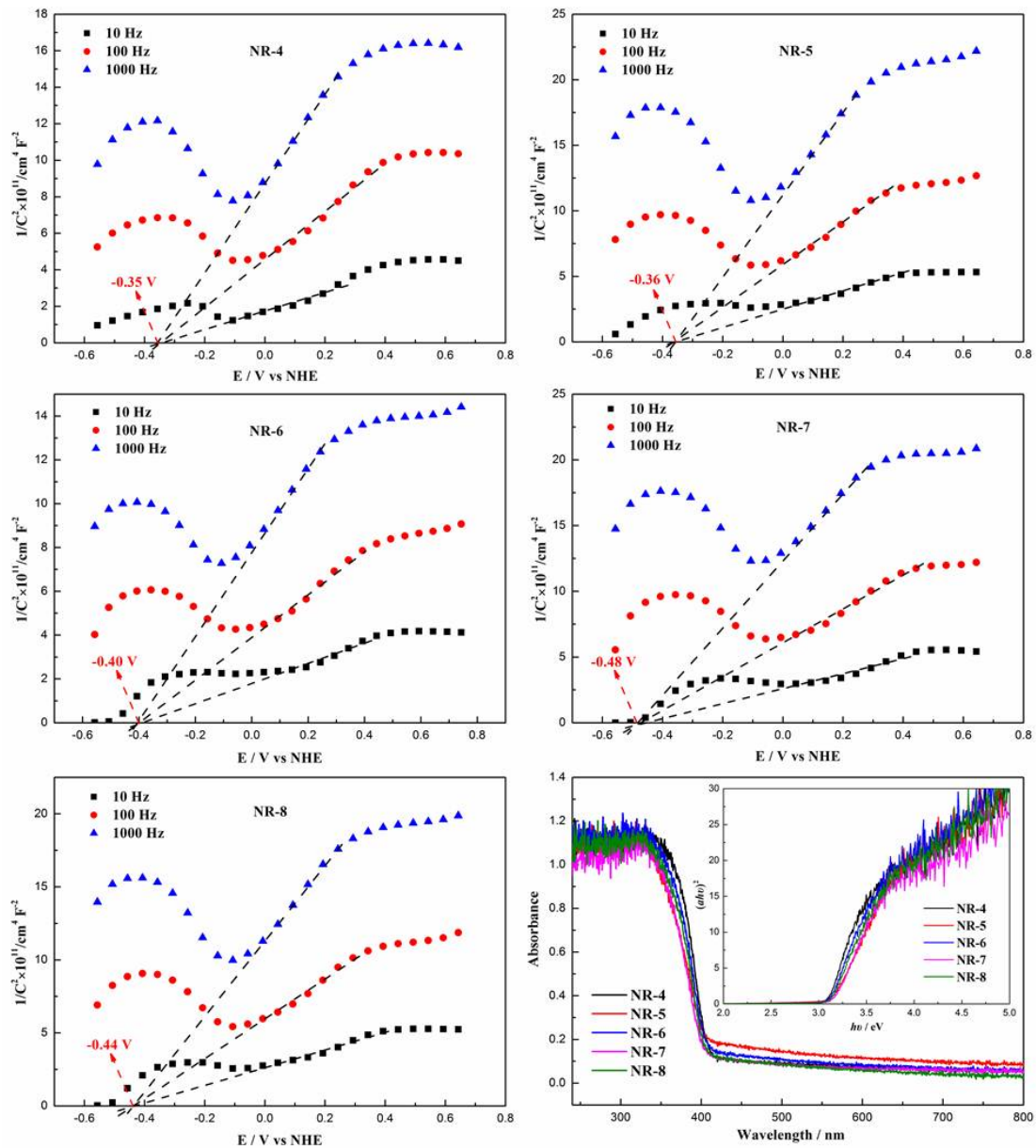
**Fig. S2** Photocatalytic evolution of the concentration ( $C/C_0$ ) of (a) MB degradation and (b) Cr(VI) reduction using samples NR-4–8 without polymer.



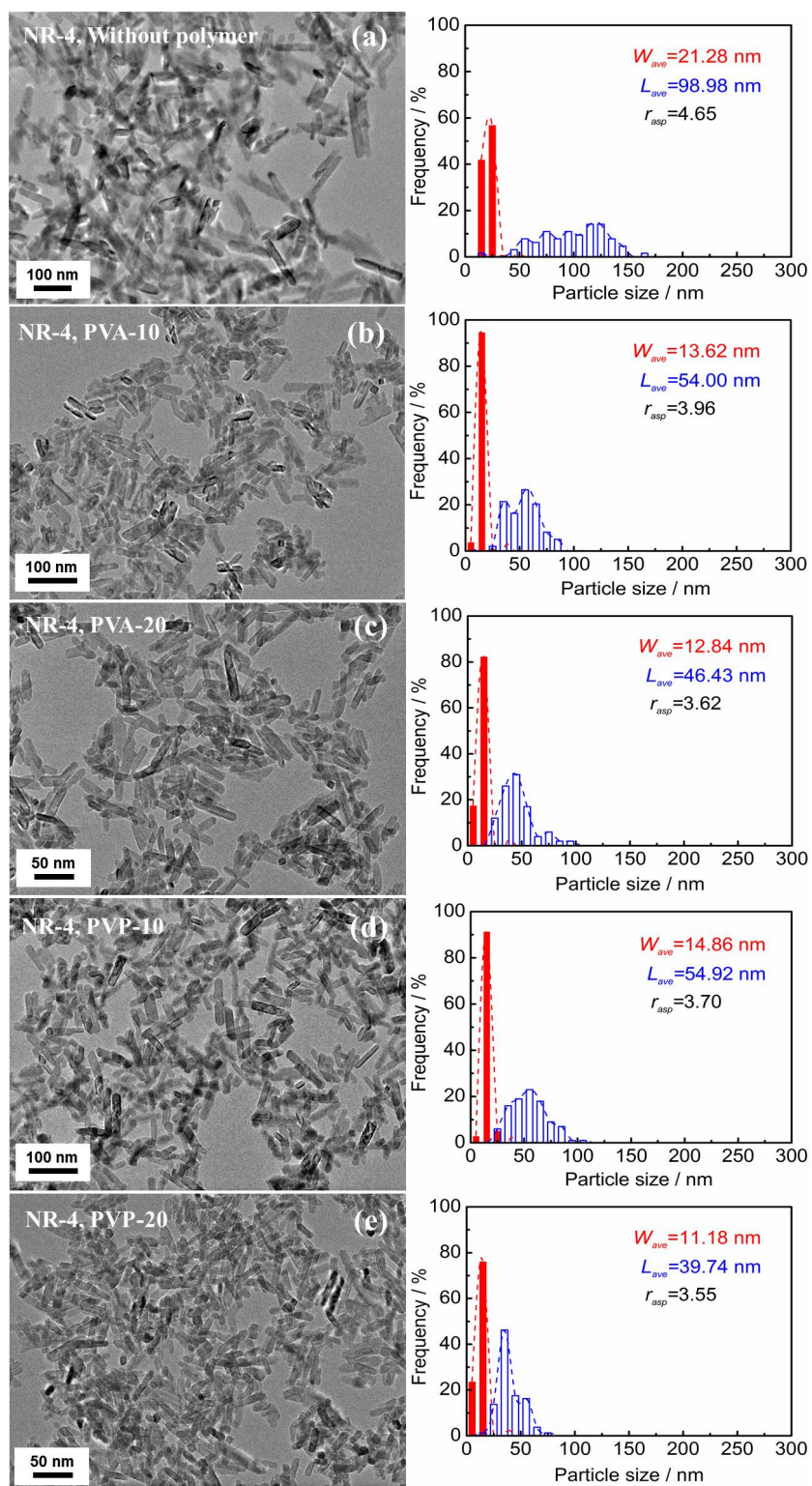
**Fig. S3** Degradation of MB with recycled NR-4 and reduction of Cr(VI) with recycled NR-7.



**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.

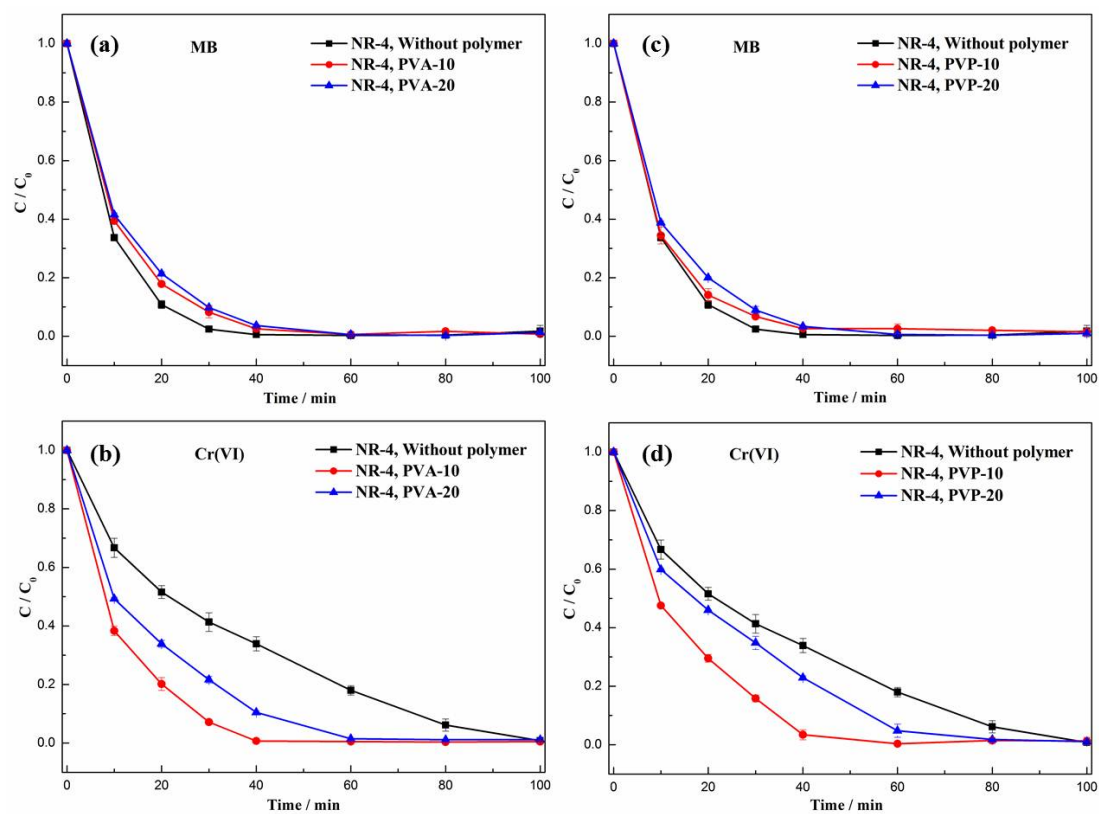


**Fig. S5** Mott-Schottky plots obtained at different frequencies for the TiO<sub>2</sub> film electrodes prepared with samples NR-4–8 without polymer (TiO<sub>2</sub> film / Saturated Calomel / Pt in 0.1 M KCl) and their UV-Vis diffuse reflectance spectra (corresponding polts of  $(\alpha h\nu)^2$  verse energy ( $h\nu$ ) for samples NR4~8 inserted).

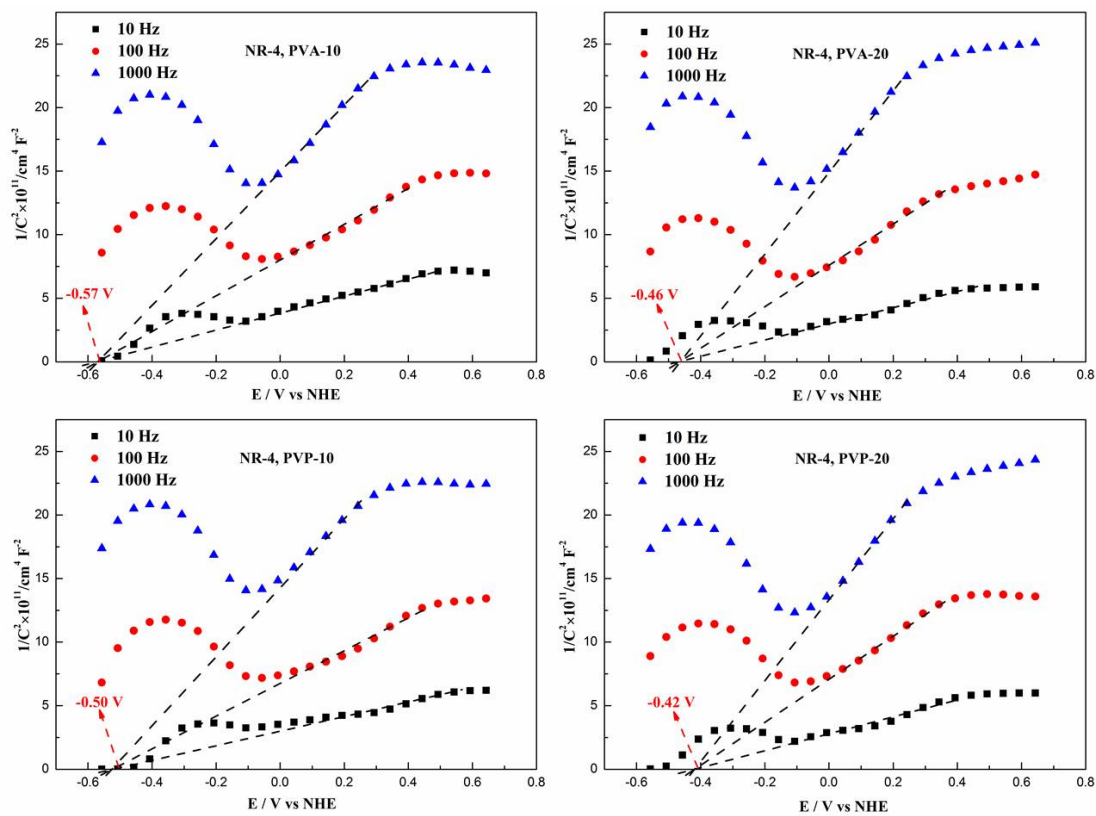


**Fig. S6** TEM images (left) and corresponding histograms of particle width (red) and length (blue) (right) of samples NR-4 (a) without polymer (b) with 10 mg PVA (c) with 20 mg PVA (d) with 10 mg PVP (e) with 20 mg PVP.

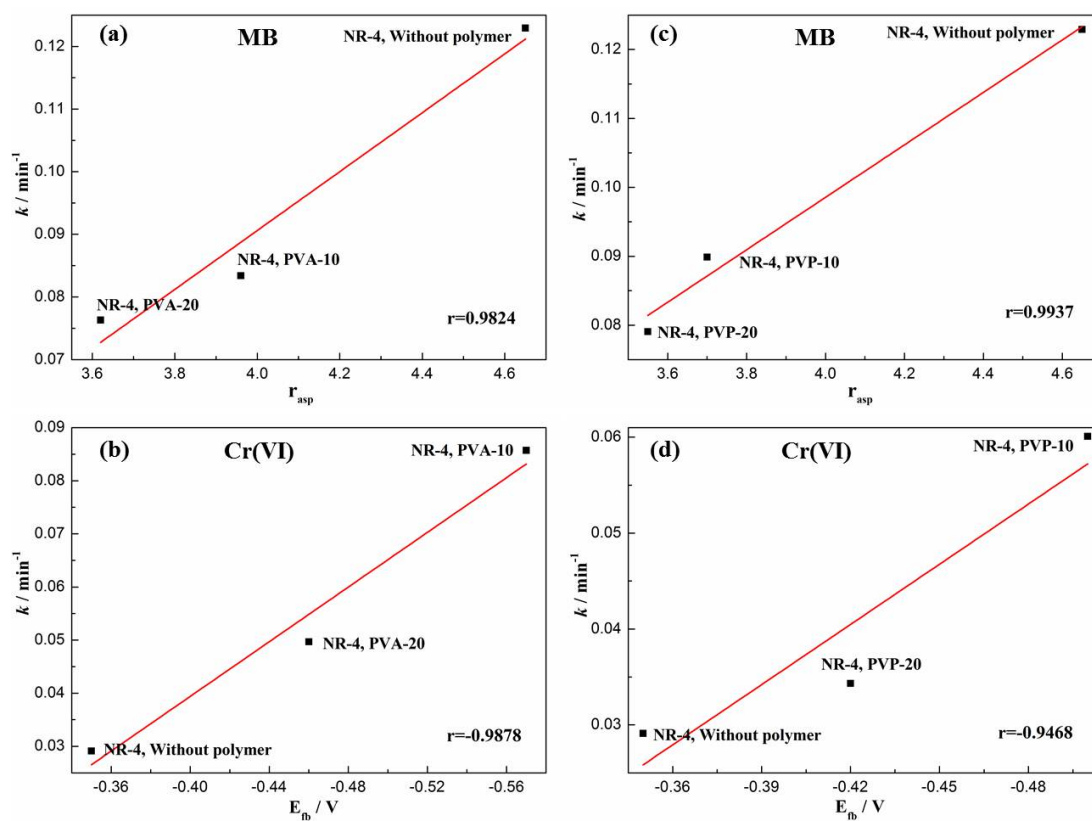




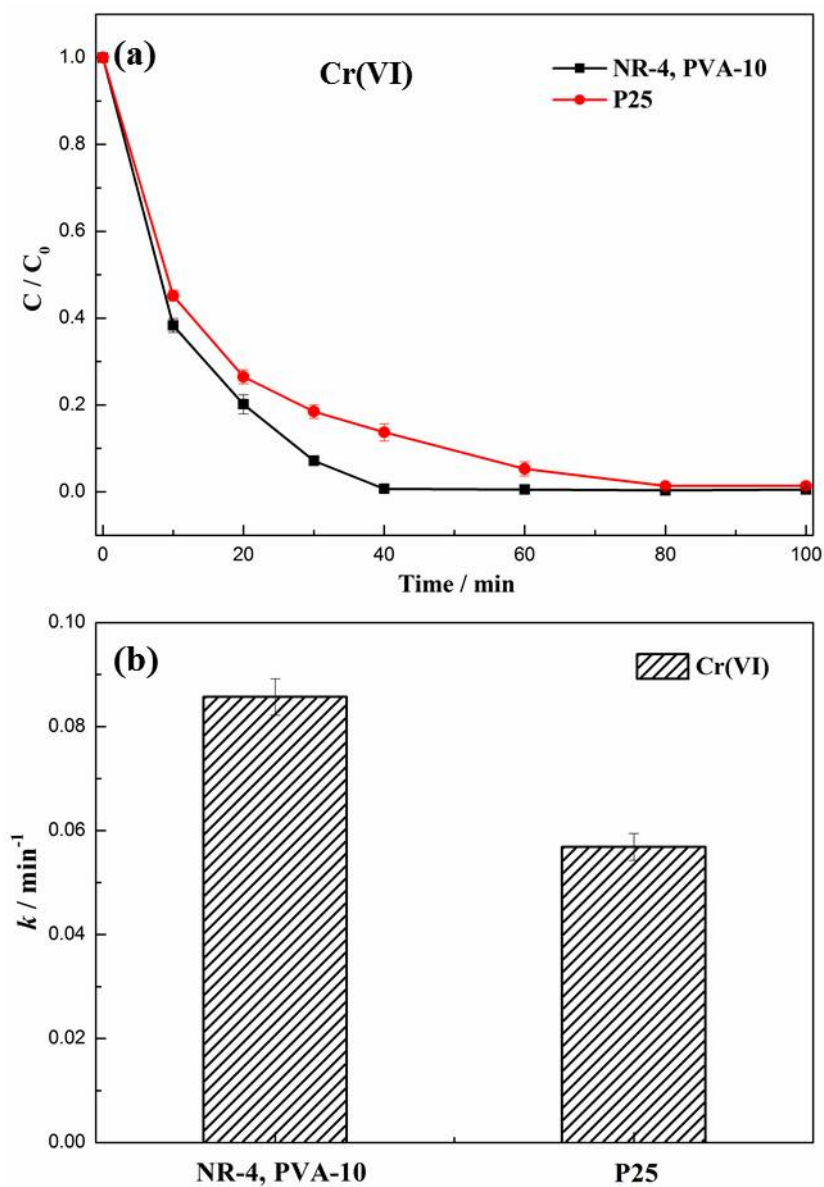
**Fig. S7** Photocatalytic evolution of the concentration ( $C/C_0$ ) of MB degradation and Cr(VI) reduction using NR-4 samples synthesized without polymer and with different amounts of PVA / PVP.



**Fig. S8** Mott-Schottky plots obtained at different frequencies for the TiO<sub>2</sub> film electrodes prepared with samples NR-4 with different amounts of PVA / PVP (TiO<sub>2</sub> film / Saturated Calomel / Pt in 0.1 M KCl).



**Fig. S9** Correlations between (a) (c)  $k$  and  $r_{\text{asp}}$ ; (b) (d)  $k$  and  $E_{\text{fb}}$  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 ( $S_{\text{BET}}=51.67 \text{ m}^2 \text{ g}^{-1}$ ).