Incorporative Effect of Pt and Na₂CO₃ on TiO₂-Photocatalyzed Degradation of Phenol in Water

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Figure S1. (A) XRD patterns, (B) DRS spectra, (C) N₂ adsorption–desorption isotherms and (D) Photoluminescence spectra, measured with (a) TiO₂ and (b) Pt/TiO₂. Reflectance (*R*) is transferred to the Kubelka–Munk (K–M) absorbance $F_R = (1 - R)^2/2R$. XRD was made on a Rigaku D/max-2550/PC diffractometer (Cu K α 1 radiation). DRS was recorded on a Shimadzu UV-2550 with BaSO₄ as a reference. N₂ adsorption was measured at 77 K on a Micromeritics ASAP2020. Photoluminescence spectra was measured on a Shimadzu F-2500 spectrofluorometer.



Figure S2. Formation of intermediates with hydroquinone (A) and benzoquinone (B) measured in the aqueous solution, under the conditions of (a) TiO_2 , (b) $TiO_2 + 2.0$ mM carbonate, (c) Pt/TiO₂ and (d) Pt/TiO₂ + 2.0 mM carbonate.



Figure S3. Linear sweep voltammetry with (A) TiO_2 and (B) Pt/TiO_2 film electrode recorded in the dark (dotted lines), and under UV light (solid lines), at a scan rate of 20 mV/s. Experiments were carried out under N₂ in 0.5 M NaClO₄ at pH 8.0, (a) in the absence, and (b) the presence of 2.0 mM Na₂CO₃.



Figure S4. Homogeneous degradation of phenol under UV light ($\lambda \ge 240$ nm) in aqueous solution at pH 8.0, measured with (a) 0.1 M H₂O₂, (b) 0.1 M H₂O₂ + 10 mM Na₂CO₃ and (c) 0.1 M H₂O₂ + 50 mM Na₂CO₃.