

## Supplementary Materials for:

# Regarding the Nature of Charge Carriers Formed by UV or Visible Light Excitation of Carbon-Modified Titanium Dioxide

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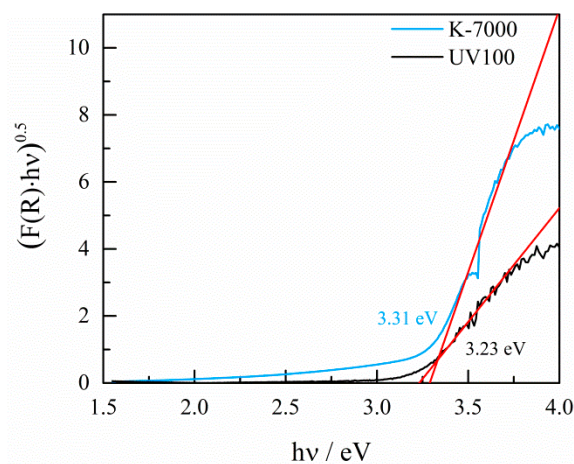


Figure S1. Determination of the bandgap of K-7000 and UV100 *via* the Tauc plot.

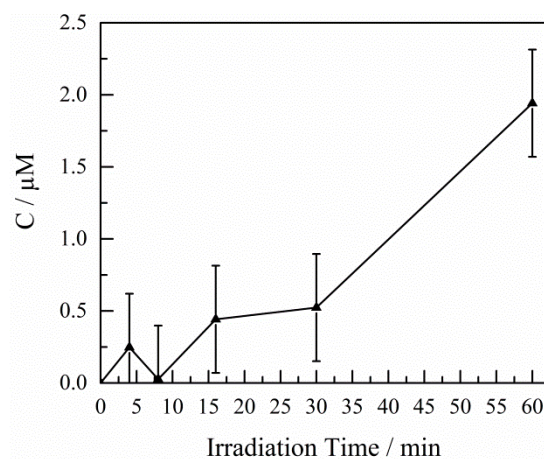
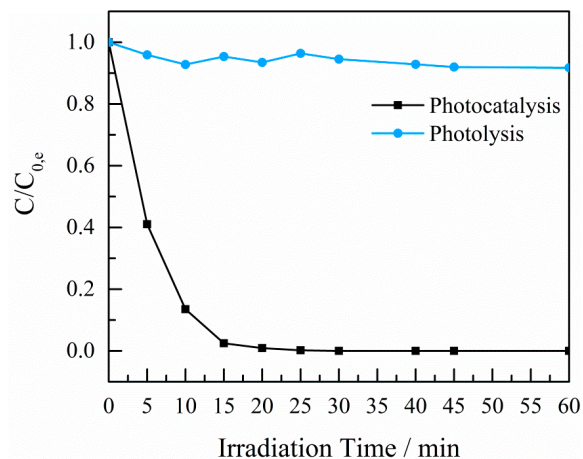
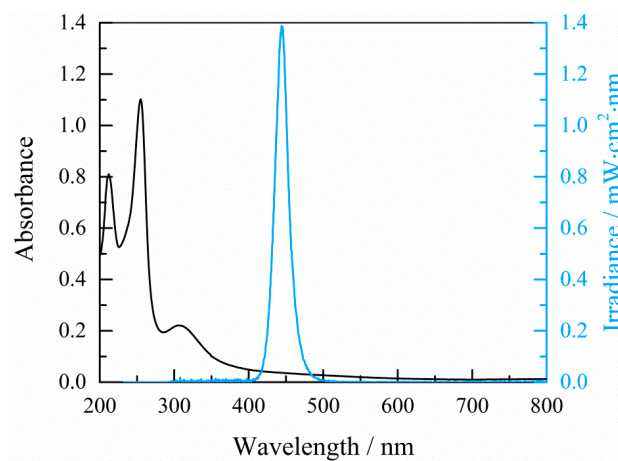


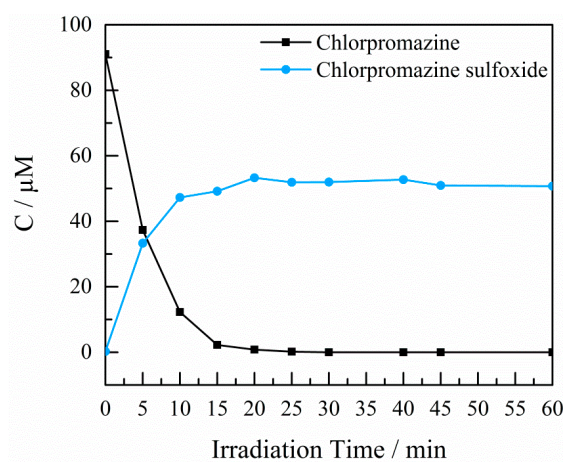
Figure S2. Kinetic profile for the formation of formaldehyde upon the photocatalytic oxidation of methanol ( $C_0 = 100 \mu M$ ) under visible light irradiation in the presence of K-7000.



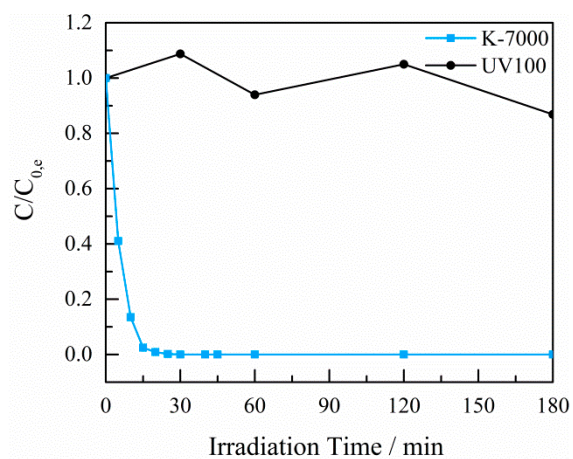
**Figure S3.** Photolysis and photocatalytic conversion (in the presence of K-7000) of chlorpromazine under visible light irradiation.



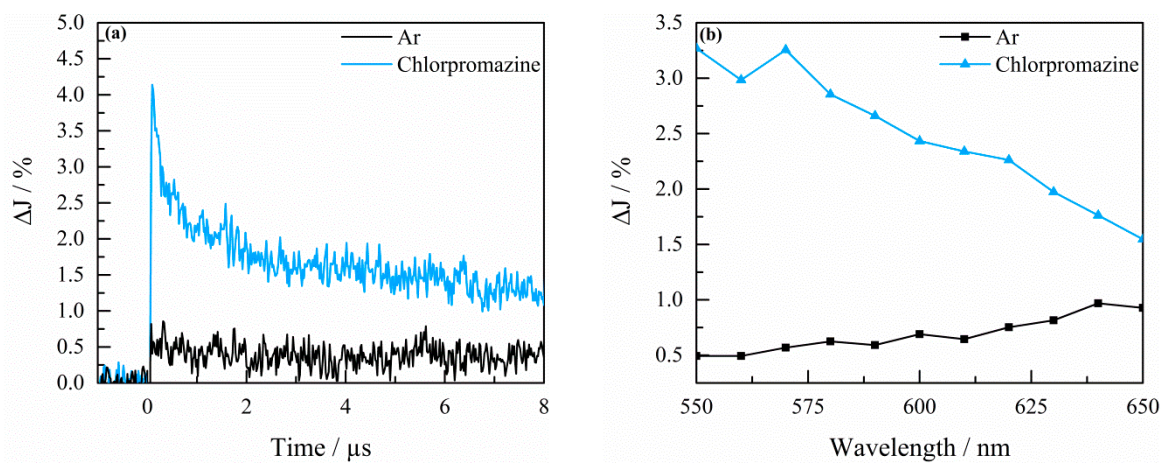
**Figure S4.** Absorption spectrum of a 100  $\mu\text{M}$  aqueous solution of chlorpromazine (black line), and emission spectrum of the employed light source (blue line).



**Figure S5.** Photocatalytic conversion of chlorpromazine to the main product chlorpromazine sulfoxide in the presence of K-7000 under visible light irradiation.



**Figure S6.** Photocatalytic conversion of chlorpromazine under visible light irradiation in the presence of K-7000 and Hombikat UV100.



**Figure S7.** (a) Transient absorption decays of K-7000 observed at 550 nm and (b) transient absorption spectra of K-7000 measured at 100 ns after the laser excitation in an Ar atmosphere and in the presence of chlorpromazine after excitation with 455 nm.