**Supporting information for:**

**Hot Electrons Coupling-Enhanced Photocatalysis of Super Black Carbon Aerogels/TiO2 Composite**

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FIG. S1. TGA results of different samples: (a) pure CA could be oxidized when the temperature reached 500 $℃$. (b-f) composite sheets show multiple weight loss process, which could be divided into four stages: I) the evaporation of water and solvent, II) the evaporation and decomposition of PVDF, III) the oxidation of CA, and IV) the residual and pure TiO2.



Fig. S2. The relationship between the concentration of methylene blue solution and absorbance.

**Detailed calculate process of actual light distribution ratio (LDR) of CA and TiO2:**

For CA sheet, according to Fig. 2 (d) and equation (2)-(3),

$$R\_{CAsheet}=R\_{b}+(1-R\_{b})(100\%∙R\_{CA})$$

where average reflectivity of CA sheet ($R\_{CAsheet}$) and bulk CA ($R\_{CA}$) is 2.52% and 0.59%, respectively. Therefore, $R\_{b}$ should be 1.94%. Similarly:

$$R\_{TiO\_{2}-CA0\%}=R\_{b}+(1-R\_{b})(100\%∙R\_{TiO\_{2}})$$

Therefore, $R\_{TiO\_{2}}$ should be 97.86%.

For composite sheets:

$$R\_{sheet}=R\_{b}+(1-R\_{b})(r\_{CA}R\_{CA}+r\_{TiO\_{2}}R\_{TiO\_{2}})$$

$$r\_{CA}+r\_{TiO\_{2}}=100\%$$

Therefore,

$$r\_{TiO\_{2}}=(\frac{R\_{sheet}-R\_{b}}{100\%-R\_{b}}-R\_{CA})/( R\_{TiO\_{2}}-R\_{CA})$$

Therefore,

$$r\_{TiO\_{2}}=(\frac{R\_{sheet}-1.94\%}{98.06\%}-0.59\%)/(97.27\%)$$