Supporting Information

Pt nanoparticles and CdS quantum dots assisted WO_3 nanowires grown on flexible carbon fibers for efficient oxygen production

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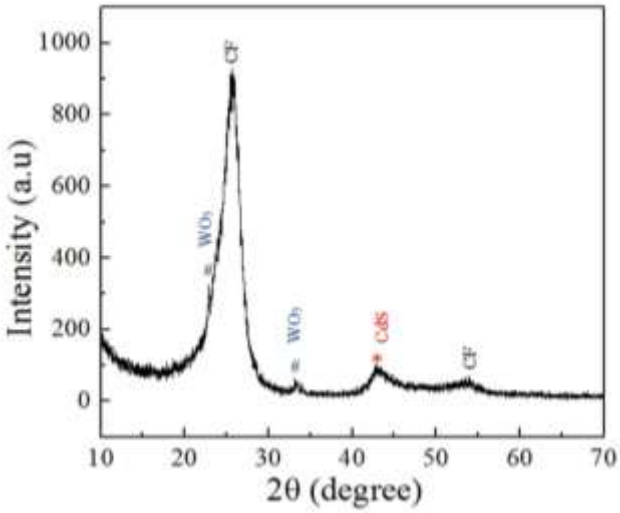

Fig. S1. XRD pattern of CF-WO_3-Pt-CdS heterostructure. Their characteristic diffraction peaks were identified and can be ndexed to WO_3 monoclinic structure and CdS hexagonal structure (standard cards JCPDS No. 89-4476 and JCPDS No. 08-0459) respectively.

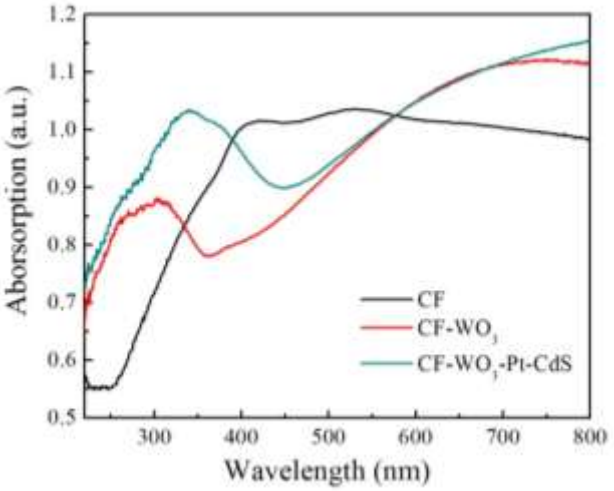

Fig.S2. UV-Vis diffuse reflectance spectra of carbon fibers (black), CF-WO_3 (red), and CF-WO_3-Pt-CdS (cyan) samples

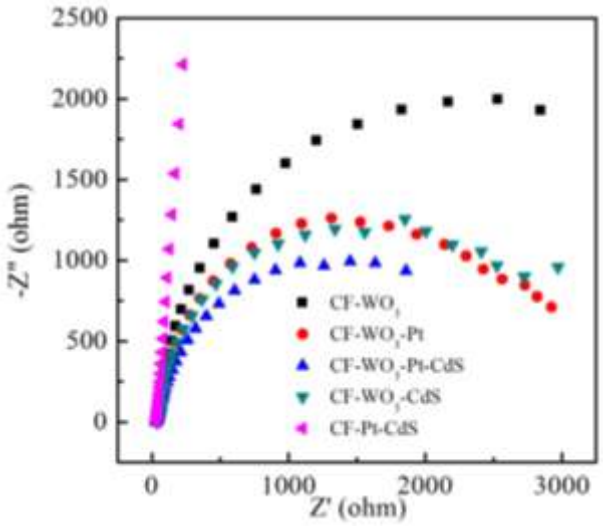

Fig.S3. EIS Nynquist plots of (a)the CF-WO_3 (black), CF-WO_3-Pt (red), CF-WO_3-Pt-CdS (blue), CF-WO_3-CdS (cyan) and CF-Pt-CdS (peak) electrodes under visible irradiation (λ>420 nm).

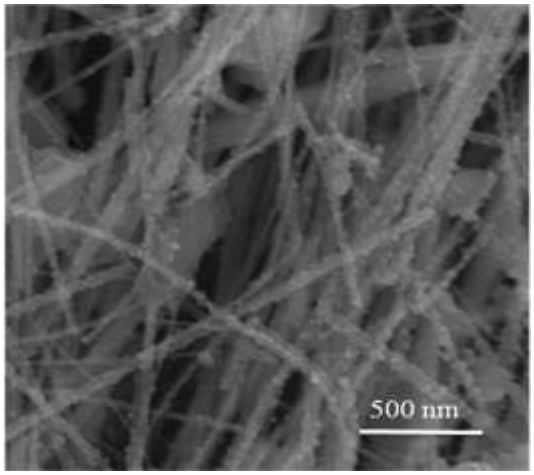

Fig.S4. SEM image of CF-WO_3-Pt-CdS after the photocatalytic O_2 production in the presence of $AgNO_3$ as sacrificial electron scavenger.

Photodegradation of MB experiments

The photocatalytic activities of as-prepared samples were evaluated by the photodegradation of 1.0×10^{-5} M MB under visible irradiation (120mW•cm^{-2}, λ>420nm). A quartz tube with capacity of 80 mL MB solution serves as a photoreactor vessel. Prior to turning on the light, WO_3-Pt-CdS nanowires was immersed in the 80mL MB solution with magnetically stirring for 30 min in dark to ensure the absorption equilibrium between the photocatalyst and the MB molecules. During the photocatalytic process, the sample was fixed on the quartz tube and irradiated straightly with the light keeping magnetically stirring to ensure the

uniform degradation. 3 mL of the MB solution was sampled at given time intervals (30 min) and the concentration of MB was analyzed by the corresponding variations of absorption at maximum absorption wavelength of 663 nm in a UV-Vis spectrophotometer (lambda 750).

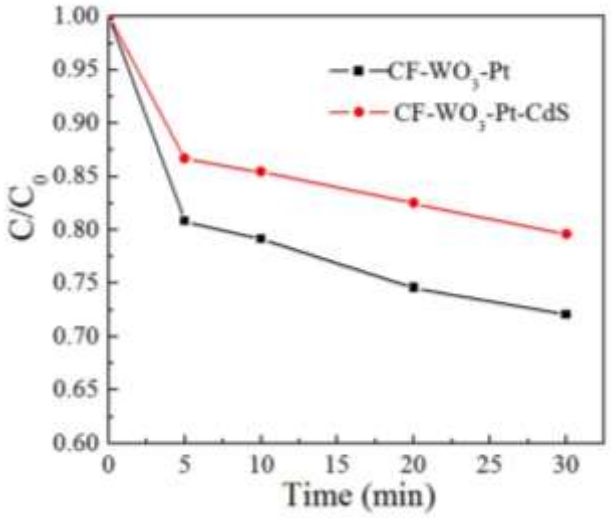

Fig.S5. The adsorption of MB on CF-WO_3-Pt (black), and CF-WO_3-Pt-CdS (red) heterostructure under dark.

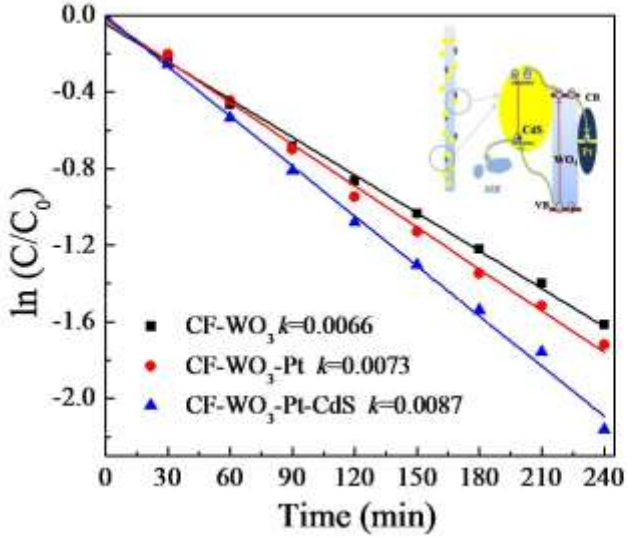

Fig.S6. Visible-light-driven photodegradation of MB (10^{-5}M) by CF-WO_3 (black), CF-WO_3-Pt (red), and CF-WO_3-Pt-CdS (blue) heterostructure (MB initial concentration=1.0×10^{-5} M). The inset figure is the schematic for the energy band structure of the CF-WO_3-Pt-CdS heterostructure and proposed machanism of MB degradation.