Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics

Quantification of Photocatalytic Hydrogen Evolution – Supporting Information

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a) Characterization of CN6

CN6 is characterized by different techniques. Wide-angle X-ray diffraction pattern reveals the graphite-like stacking of the carbon nitride layers (Figure 1, upper left). The peak at 27.4°, corresponds to an interlayer distance of 0.326 nm (resembling the (002) reflection of graphite) while the broad peak at around 13° can be attributed to the intralayer periodicity within a carbon nitride sheet. Ultraviolet-visible diffuse-reflectance spectrum shows a strong absorption in the visible region (Figure 1, upper right). The carbon nitrides absorb at 450 nm corresponds to the band gap transitions from N2p to C2p orbitals typical of semiconductor type electron transition. The shoulder band from 450 to 600 nm is most likely attributed to the presence of impurities such as carbon during the CN structure formation. The nitrogen sorption measurements show type IV isotherm typical for mesoporous materials with surface area about 173 m^2/g (Figure 1, down left), pore diameter of 40 Å (Figure 1, down right), and total pore volume of about 0.28 cm^3/g. The X-ray diffraction (XRD) measurements were performed on a Bruker D8 Advance X-ray diffractometer using CuKα1 irradiation (λ = 0.154 nm). The pore diameter and distribution are obtained by using the Barrett−Joyner−Halenda (BJH) method. UV-Visible measurement was carried out on a Cary 300 scan UV-Visible spectrophotometer in diffuse reflectance mode.

b) Photocatalytic setup

The photocatalytic setup which was used in the experiments is shown in Figure 2. The setup consists of the photoreactor, a thermostat, a light source (sun simulator/Xe-lamp), a schlenk-line and a computer.

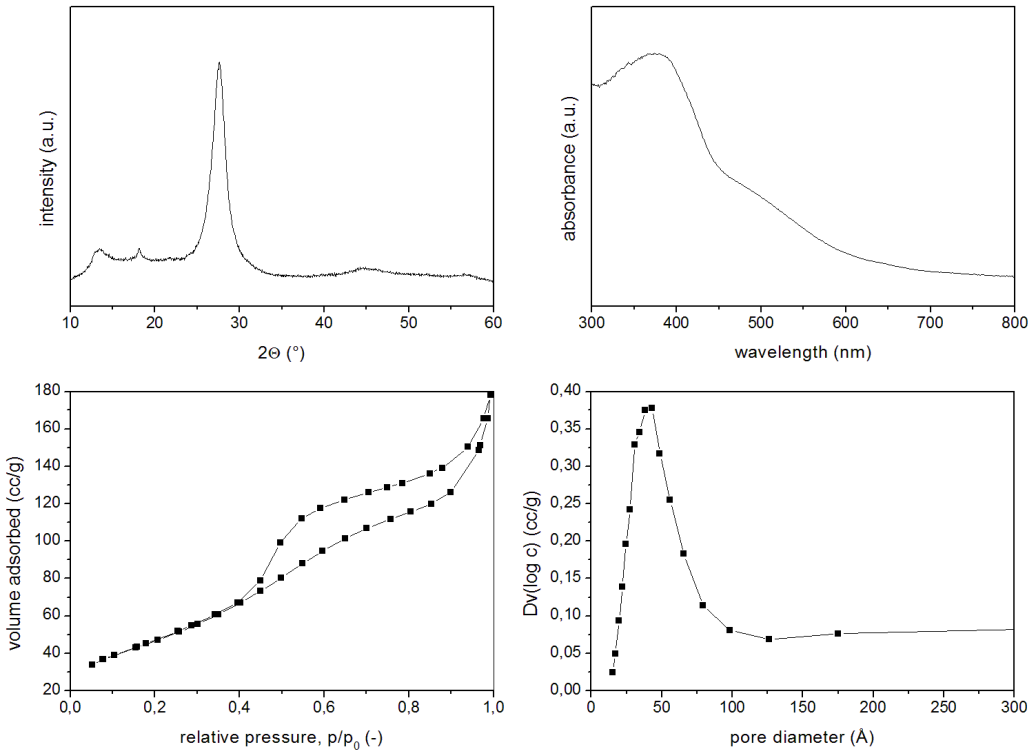

Figure 1. Characterization of CN6 material: XRD pattern (upper left), UV/Vis reflectance spectra (upper right), nitrogen sorption isotherm (lower left), and pore size distribution of CN6 sample (lower right).

Figure 2. Photocatalytic setup for stirred dispersions.