Supporting Information

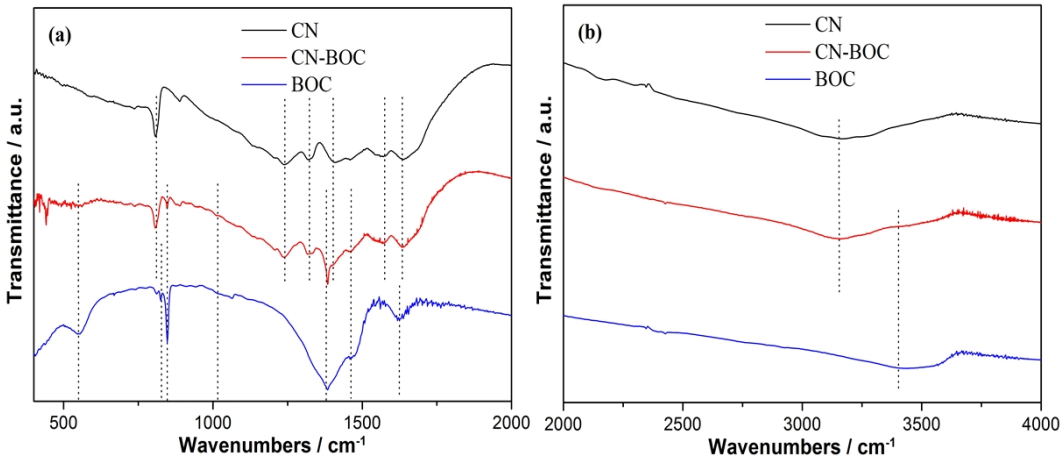

Fig. S1 FT-IR spectra for CN, CN-BOC and BOC.

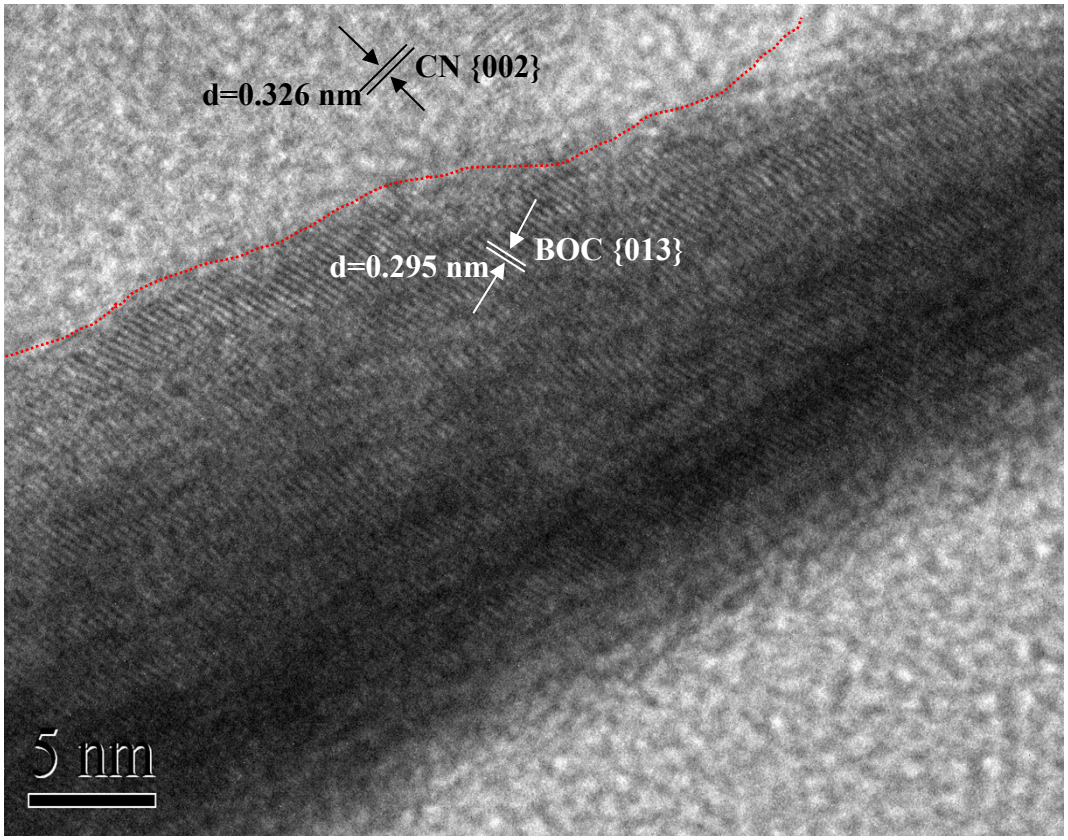

Fig. S2 HRTEM images of the as-synthesized CN-BOC.

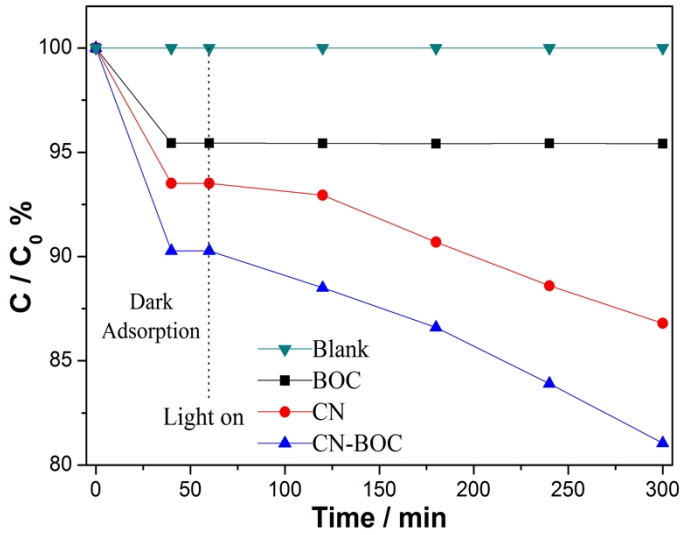

Fig. S3 Adsorption and photocatalytic activity of the as-synthesized CN, CN-BOC and BOC for removal of phenol under visible light irradiation ($\lambda > 420$ nm).

Photocatalytic activity of CN, CN-BOC and BOC for degradation of aqueous phenol was evaluated in a quartz glass reactor. 0.05 g of the as-prepared samples was dispersed in phenol aqueous solution (55 mL, 50 mg/L). The light irradiation system contains a 500 W Xe lamp with a jacket filled with flowing and thermostatted aqueous $NaNO_2$ solution (1 M) between the lamp and the reaction chamber as a filter to block UV light (λ□400 nm) and eliminate the temperature effect. Before irradiation, the suspension was allowed to reach equilibrium with continuous stirring for 60 min. The degradation efficiency of phenol was evaluated using the UV-vis absorption spectra to measure the peak value of a maximum absorption of phenol solution. During the irradiation, 5mL of suspension was continually collected from the reaction cell at given time intervals for subsequent phenol concentration analysis after centrifuging. The maximum absorption of phenol is at the wavelength of 270 nm. The removal ratio η (%) can be calculated as:

$$\eta(\%)=(C_0-C)/C_0\times100\%$$

Where, C_0 is the initial concentration of phenol considering phenol adsorption on the catalyst and C is the revised concentration after irradiation.

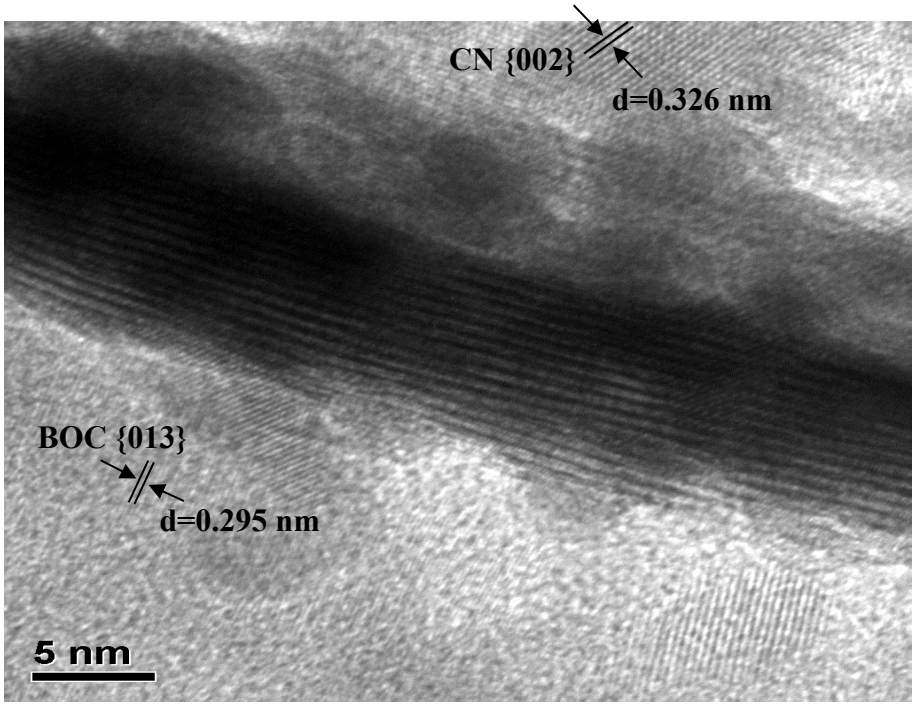

Fig. S4 HRTEM image of CN-BOC sample after 4 recycle runs.