Supporting information

Highly reproducible synthesis of carbon nanoparticles as white light phosphors and metal-free catalysts for the reduction of nitrophenol

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Experimental Details:

Materials: Sucrose purchased from spectrochem chemicals Pvt limited, 4-nitrophenol obtained from Rankem chemicals, sodium borohydride from Aldrich chemicals and de-ionised water was used throghtout whole experiment. All analytical grade chemicals were used in the experiments.

Synthesis of CNPs: In a typical procedure, series of sucrose solutions of different concentrations (1, 2, 3 and 4 wt %) were prepared using de-ionized water as solvent. Then 40 ml of the sucrose solutions were transferred to 50 ml Teflon-lined stainless steel autoclave and heated in a muffle furnace for 1-4 h at 140-180 ^{o}C. After the reaction is over, the furnace is cooled to room temperature.

Characterization: The products are then characterized by various techniques. UV-Visible spectra were recorded at room temperature on a Hitachi 2900 UV-Visible spectrophotometer. The PL spectra of the GQDs solutions were recorded using a Horiba Jobin Yvon fluoromax-4 spectrofluorometer with Xe lamp as excitation source. TEM images have been taken at room temperature using JEOL FETEM. FT-IR measurements were carried out with Perkin Elmer FTIR spectroscopy. Raman spectra recorded by using WITec system excited with 532 nm laser. Atomic force microscope (AFM) experiments were carried out for the height measurements using A. P. E. Research A-100. X-ray diffraction (XRD) measurements were carried out using PAN analytical.

Catalyst execution test: First, 190 mg of $NaBH_4$ dissolved in 10 ml of deionised water to make 500 mM. Then, we added 0.5 ml of NP (1mM) to the solution of 6 ml of deionised water and 2 ml of 500 mM $NaBH_4$ aqueous solution. After some time, we took 3 ml solution and added as synthesized CNPs (0.1 ml) for the measurement and monitored the UV-Visible spectrum of during reduction of 4-NP at room temperature.

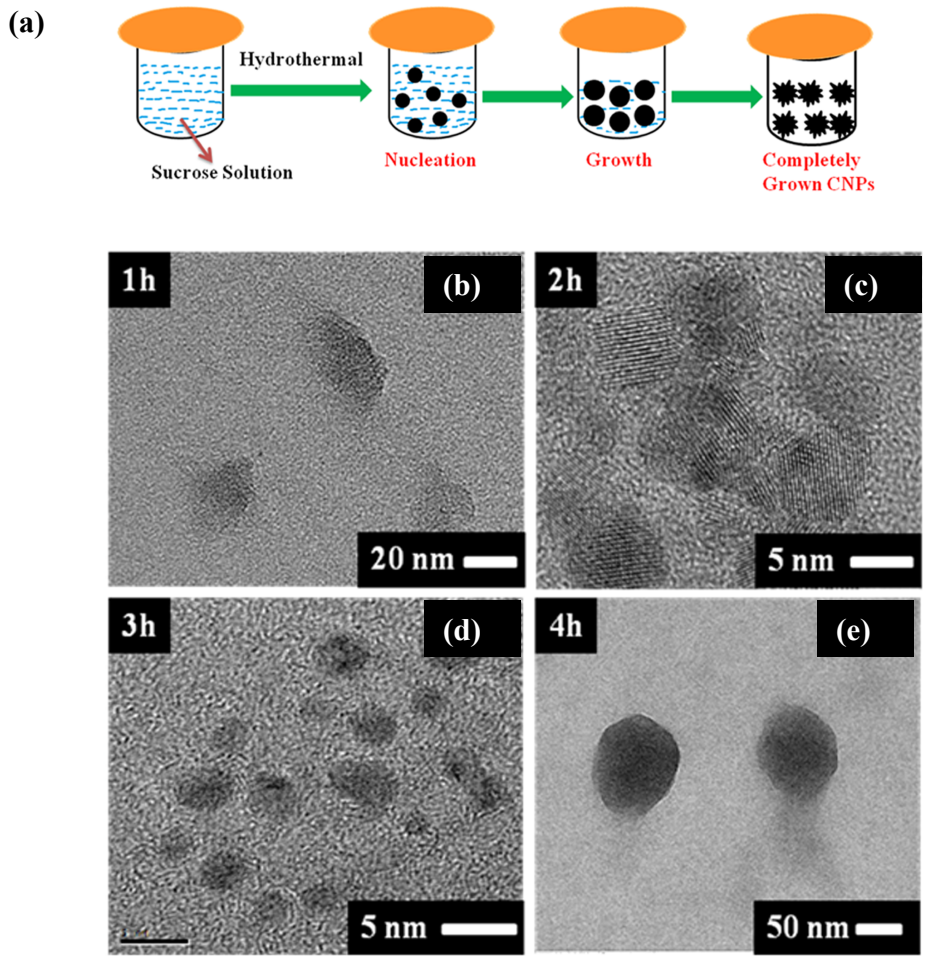

Fig. S1. (a) Schematic of the CNPs growth process.(b-e) TEM/HRTEM images of CNPs at 1.0, 2.0, 3.0 and 4.0 h @ 180°C

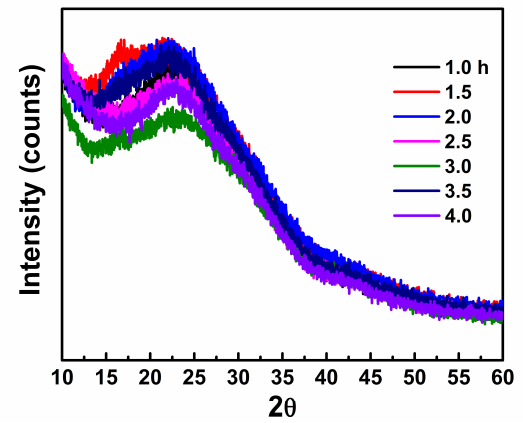

Fig. S2. XRD pattern of CNPs samples.

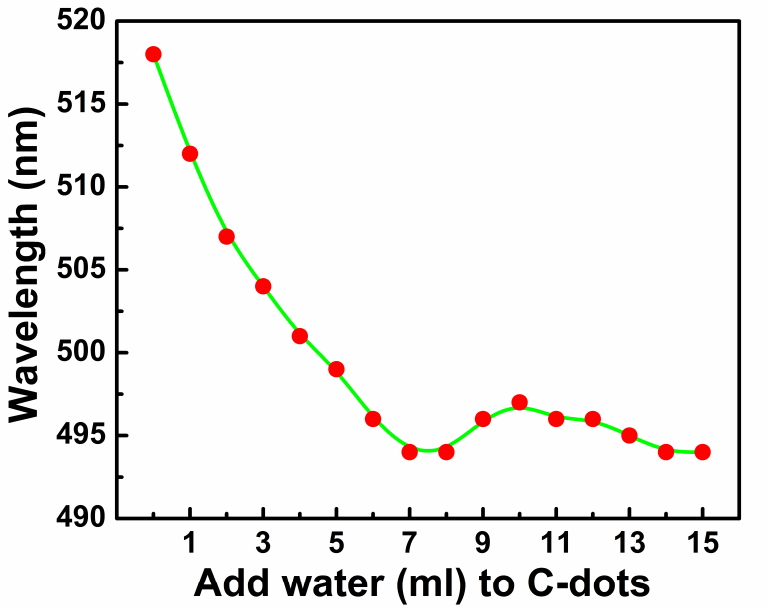

Fig. S3. Blue shift of PL of CNPs as the dilution is increasing.

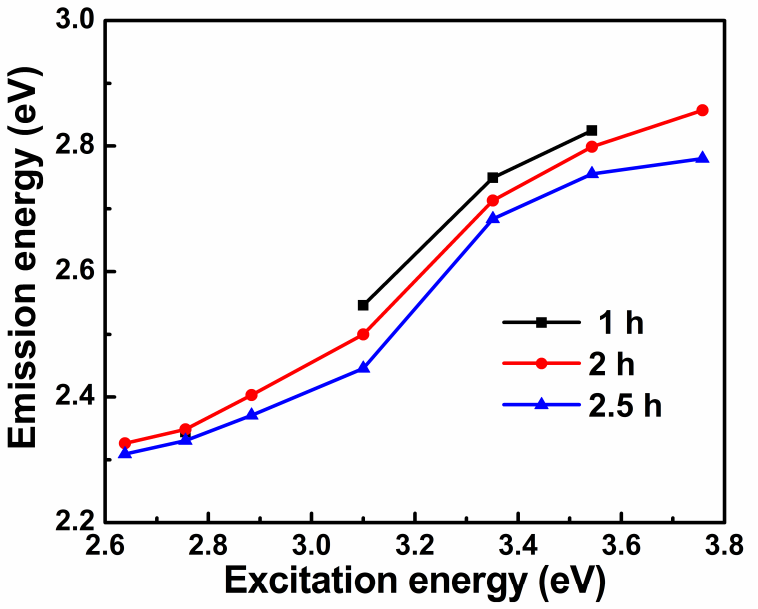

Fig S4. Emission energy as a function of excitation energy for CNPs prepared at 1, 2 and 2.5 h.

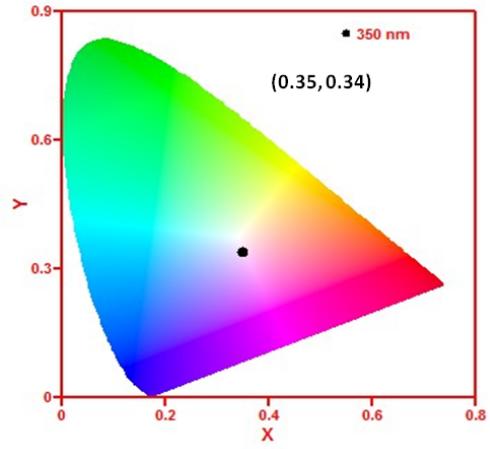

Fig S5. CIE diagram of as synthesized CNPs at 4h.

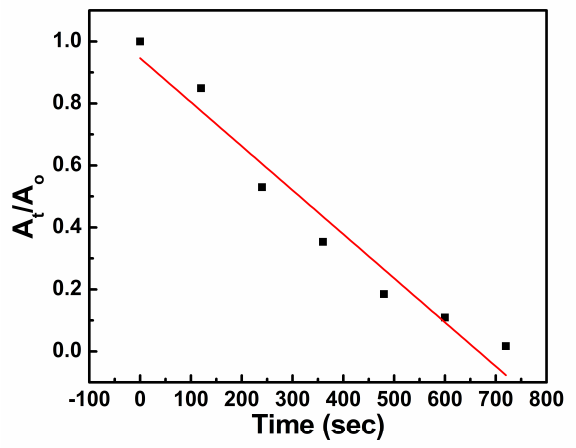

Fig S6. Plot of A_t/A_o vs time for the reduction of 4-NP at 400 nm.