Supporting Information

Supporting Figures and Schemes

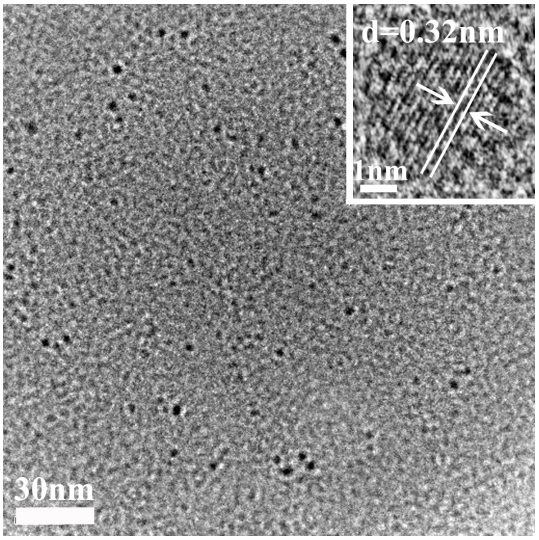

Figure S1. The TEM image of CQDs directly obtained from glucose and NaOH by ultrasonic method. Inset is the HRTEM of CQDs.

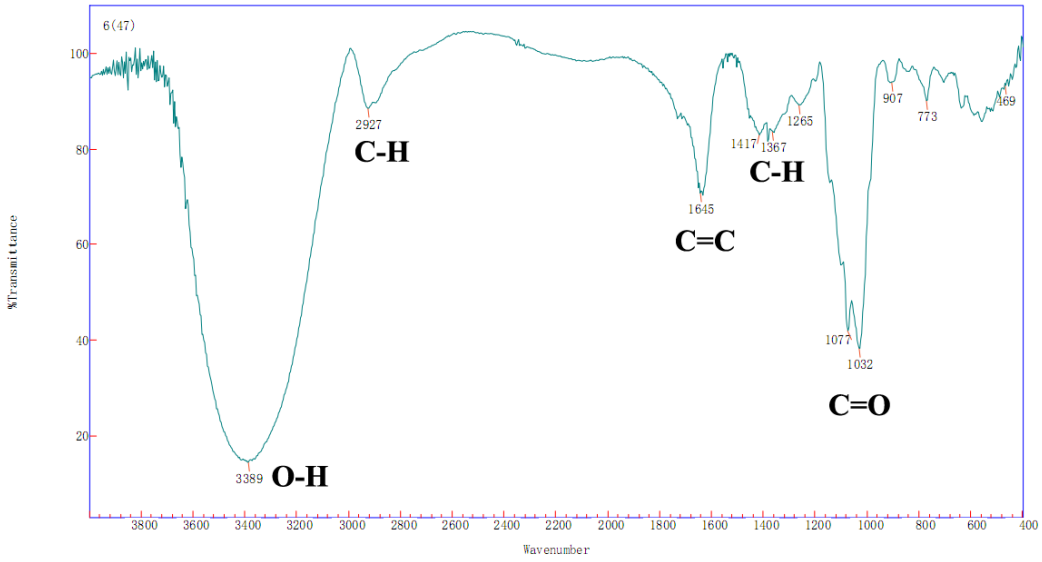

Figure S2. FTIR spectrum of CQDs.

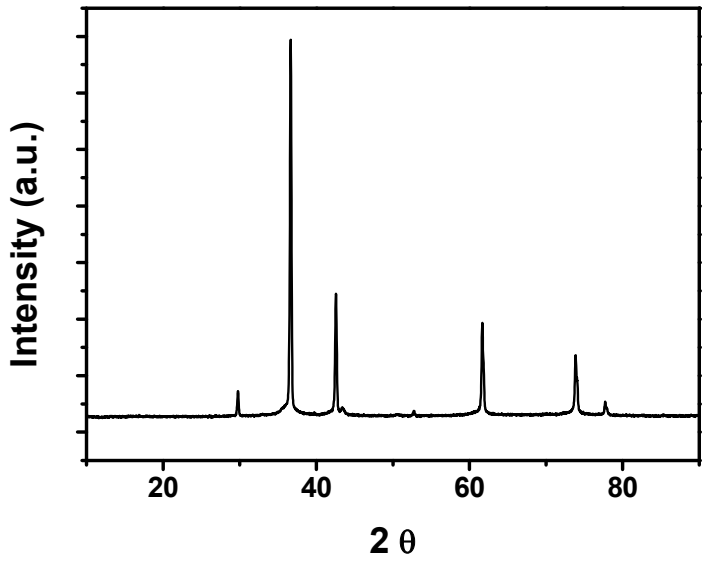

Figure S3. The XRD pattern of CQDs/Cu_2O composite.

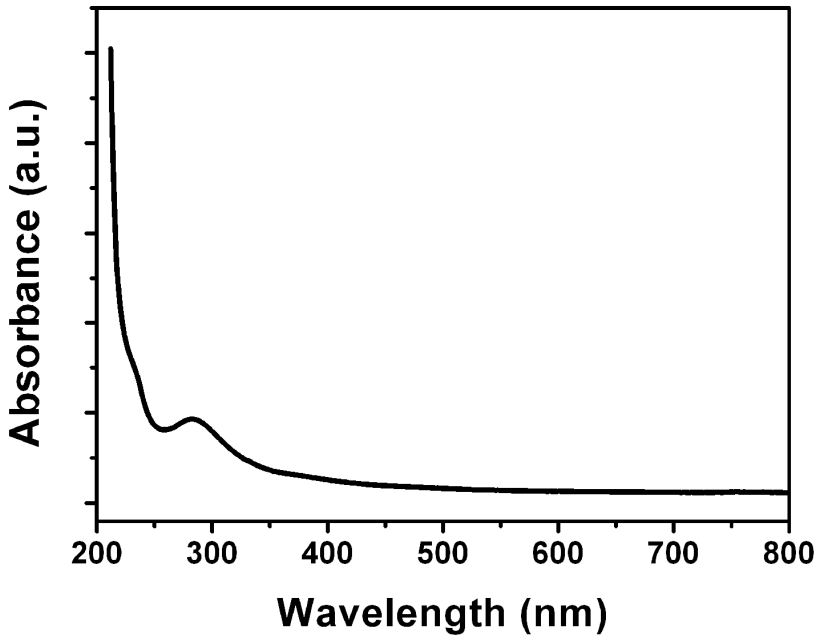

Figure S4. UV spectrum of CQDs.

The possible generating mechanism of CQDs

In the present reaction system, the CQDs were prepared from glucose and alkali under ultrasonic condition. With the reaction time increasing, the solution changed from colorless to brown, indicating the formation of CQDs. It is well known that ultrasound can generate alternating low-pressure and high-pressure waves in solution, leading to the formation and violent collapse of small vacuum bubbles. This cavitation causes high speed impinging liquid jets, deagglomeration and strong hydrodynamic shear-forces. The proposed mechanism is as follow: first the energy of ultrasonic waves make the glucose molecules be dehydrated (polymerization) to form the nucleus of CQDs composed of C=C as revealed by

FTIR (Figure S2), then the growth of CQDs occurs at the spherical surface (edge growth). With increasing reacting time, the source molecules reach the surface of the CQDs and generate new C=C by dehydration, leading to the larger CQDs. Owing to the pressure waves in solution induced by the ultrasonic condition, the freshly formed C=C is orderly arranged and assists the growth of crystalline CQDs. The functional groups O-H, -C-H, and C-O-R) located at the surface of the CQDs. Such mechanism is similar to the other reported work (L. B. Tang, R. B. Ji, X. K. Cao, J. Y. Lin, H. X. Jiang, X. M. Li, K. S. Teng, C. M. Luk, S. J. Zeng, J. H. Hao and S. P. Lau, *ACS Nano*, 2012, DOI: 10.1021/nn300760g).

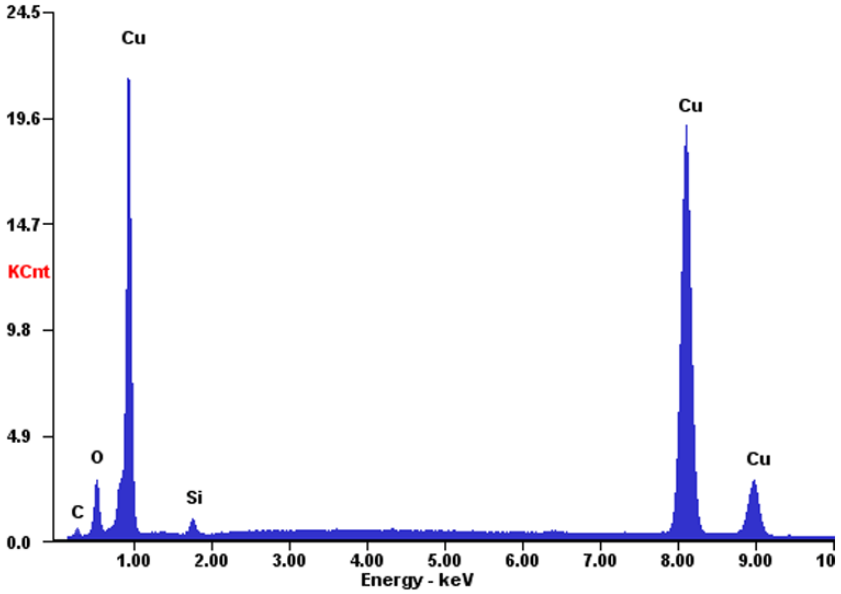

Figure S5. EDS spectrum of the CQDs/Cu_2O (g).

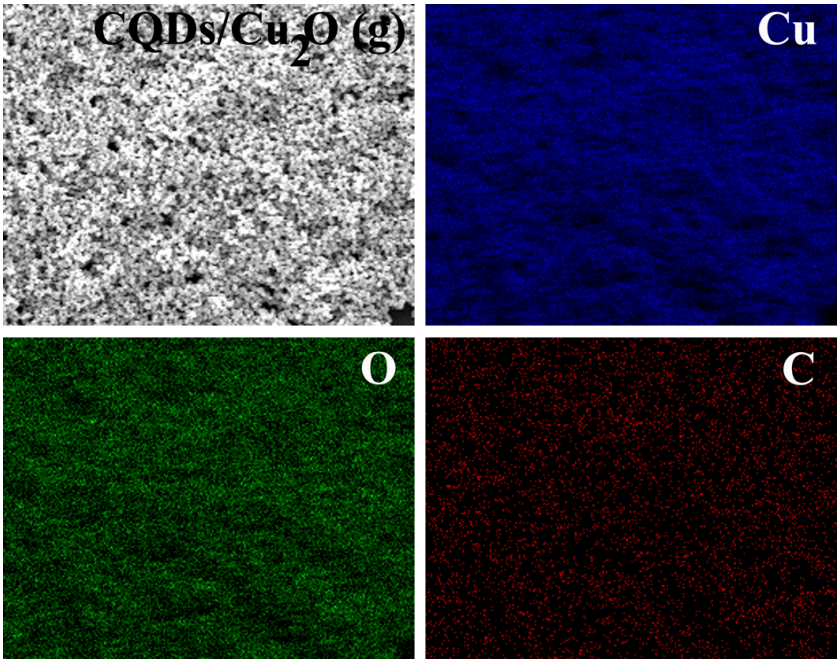

Figure S6. EDS element mapping data of (a) Cu, (b) O and (c) C elements throughout the CQDs/Cu_2O(g).

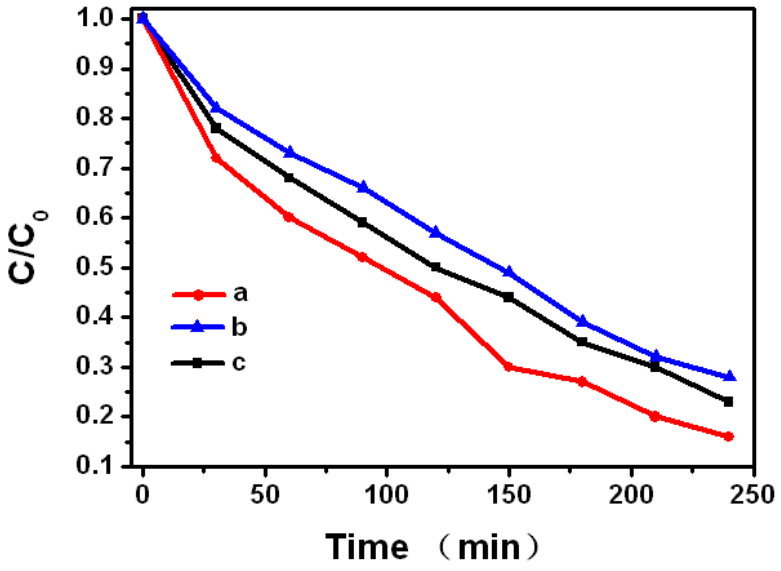

Figure S7. Photodegradation of MB over CQDs/Cu_2O a) alone, and with the addition of b) benzoquinone and c) EtOH under NIR-light irradiation.

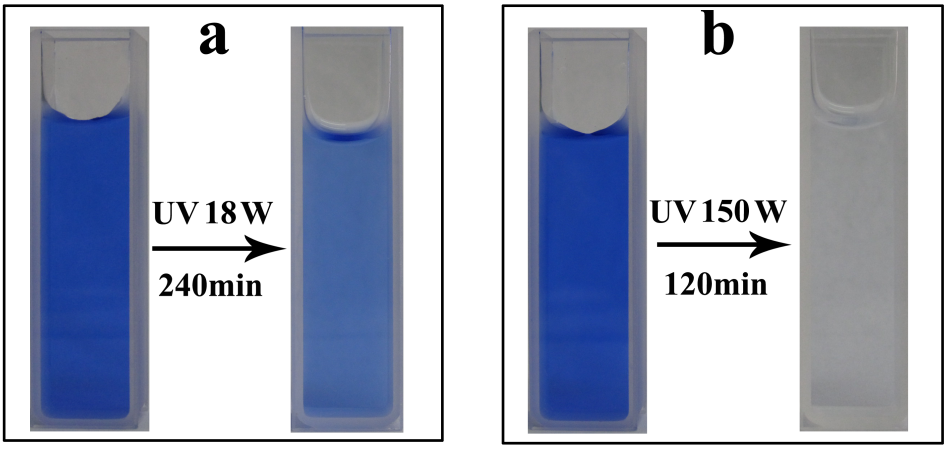

Figure S8. The digital images of MB solution under UV light irradiation for different time, (a) 18 W, 240 min; (b) 150 W, 120 min.

Table S1

Aging time (h)	10	12	14	16	18
Loading amount of CQDs (wt%)	4.95	5.57	6.37	7.16	8.31
Photocatalytic degradation of MB after 4h (%)	77	79	83	90	88

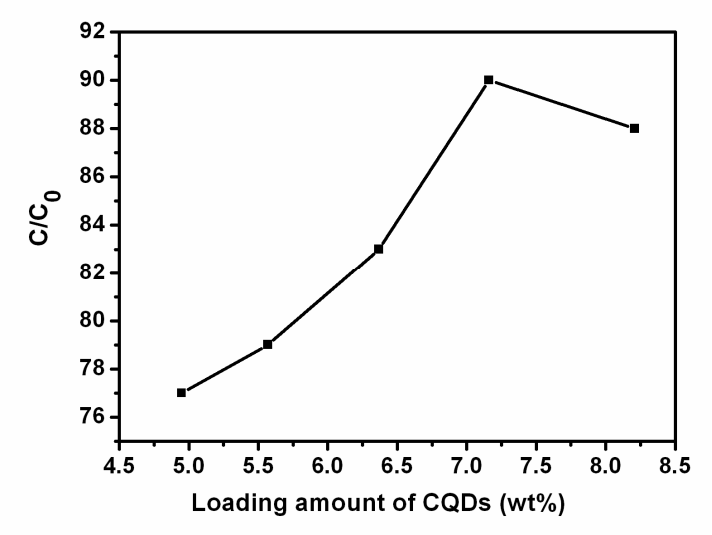

Figure S9 The relationship between loading amount of CQDs and the photocatalytic degradation ability of CQDs/Cu_2O composite on MB.

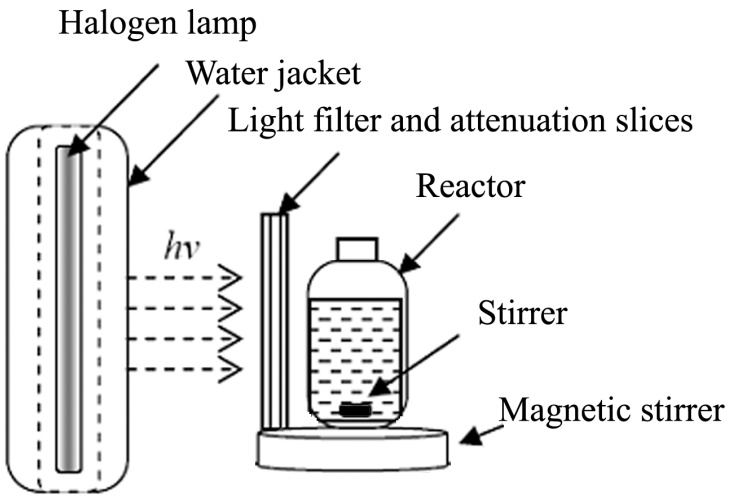

Figure S10. Schematic reactor for infrared photocatalytic degradation.