Electronic Supplementary Material (ESI) for RSC Advances.

†Electronic Supplementary Information

To check the reproducibility of results, the synthesis of CuO nanorods (S1) and CuO nanosheets (S2) were repeated twice using the aminoacids lysine and glycine. The TEM images, SAED and XRD pattern were also recorded twice in order to check the reproducibility of the results. The detailed observations of electron microscopic analysis and XRD pattern for the synthesized CuO nanorods (S1) and CuO nanosheets (S2) are shown in Fig. S1(a, b, c, d, e, f) and S2(a, b, c, d, e, f).

The size distribution and morphology of synthesized CuO nanorods (S1) is investigated from TEM image. Fig. S1 (a, b) represented the TEM image of S1 recorded for the first and second time respectively. The TEM image (Fig. S1a, S1b) showed the formation of rod-like structure having average diameter of about 30 nm and 30-31 nm respectively in both cases. Figure S1 (c, d) showed the SAED pattern of S1 recorded for first and second time respectively. The lattice planes obtained from the SAED pattern (Fig. S1c, S1d) matches well with the single phase monoclinic crystal structure of CuO (JCPDS 89-5898). The XRD pattern was also recorded twice to check the reproducibility of the results and was found same. Figure S1 (e, f) represented the XRD pattern of S1 synthesized first and second time respectively. XRD pattern were well indexed to the single phase monoclinic crystal structure of CuO crystal (JCPDS 89-5898). Therefore, similar results were obtained from TEM images, SAED and XRD pattern for the synthesis of CuO nanorods when the experiment was repeated twice. Hence, the consistency, reliability and reproducibility of the results was proved using a domestic microwave oven for the synthesis purpose.

Similarly, Figure S2 (a, b) represented the TEM images of CuO nanosheets (S2) synthesized for the first and second time using glycine respectively. TEM images showed the formation of sheet-like nanostructure having dimensions of length 300-600 nm, width 200 nm and thickness 30-60 nm respectively for both first and second time synthesized CuO nanosheets (S2). Figure S2 (c, d) showed the SAED pattern of S2 recorded for first and second time respectively. The lattice planes obtained from the SAED pattern (Fig. S2c, S2d) matches well with the single phase monoclinic crystal structure of CuO (JCPDS 89-2529). The XRD pattern of S2 was also recorded twice to check the reproducibility of the results. Figure S2 (e, f) represented the XRD pattern of S1 synthesized first and second time respectively. XRD pattern were well indexed to the single phase monoclinic crystal structure of CuO crystal (JCPDS 89-2529). Therefore, similar results were obtained from TEM images, SAED and XRD pattern for the synthesis of CuO nanosheets when the experiment was repeated twice. Hence, the reproducibility, consistency and reliability of the results was proved using a domestic microwave oven for the synthesis purpose.

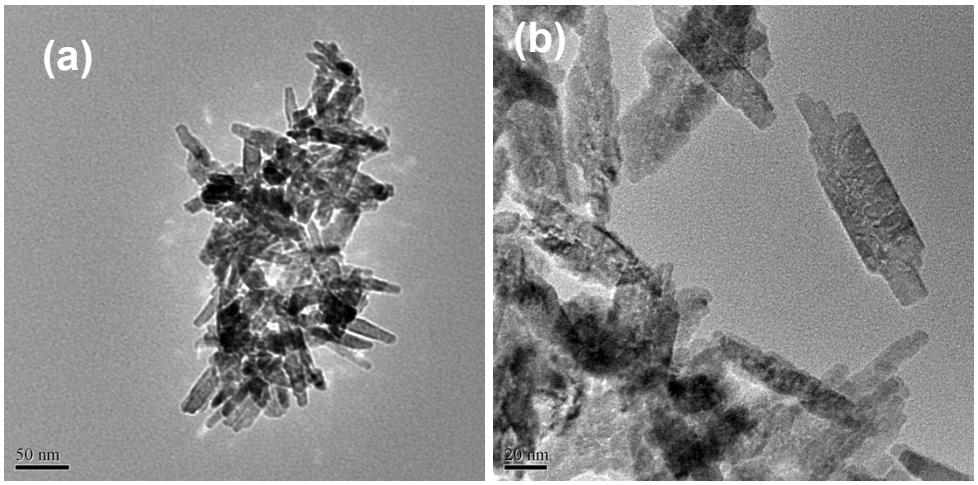
Table S1 represented the summary of the results obtained from TEM, XRD and SAED pattern for the synthesized CuO nanorods (S1) and CuO nanosheets (S2) when the experiment was repeated twice.

Figures:

1. **Figure S1.** TEM image of CuO nanorods (S1) synthesized for (a) first time, (b) second time; SAED pattern of CuO nanorods recorded for (c) first time, (d)

second time; XRD pattern of CuO nanorods synthesized for (e) first time, (f) second time respectively.

2. **Figure S2.** TEM image of CuO nanosheets (S2) synthesized for (a) first time, (b) second time; SAED pattern of CuO nanosheets recorded for (c) first time, (d) second time; XRD pattern of CuO nanosheets synthesized for (e) first time, (f) second time respectively.
3. **Figure S3.** TEM image of CuO nanoparticles formed in the absence of aminoacids.
4. **Figure S4.** UV-visible spectra of 60µl (0.006 M) p-nitro phenol in aqueous medium
5. **Figure S3.** Absorption spectra of 60µl (0.006 M) PNP + 300 µl (0.1M) $NaBH_4$ in aqueous solution
6. **Figure S4.** XRD pattern of exhausted CuO nanosheets after 5th cycle of operation as photocatalyst.
7. **Figure S5.** TEM image of exhausted CuO nanosheets after 5th cycle of operation as photocatalyst.



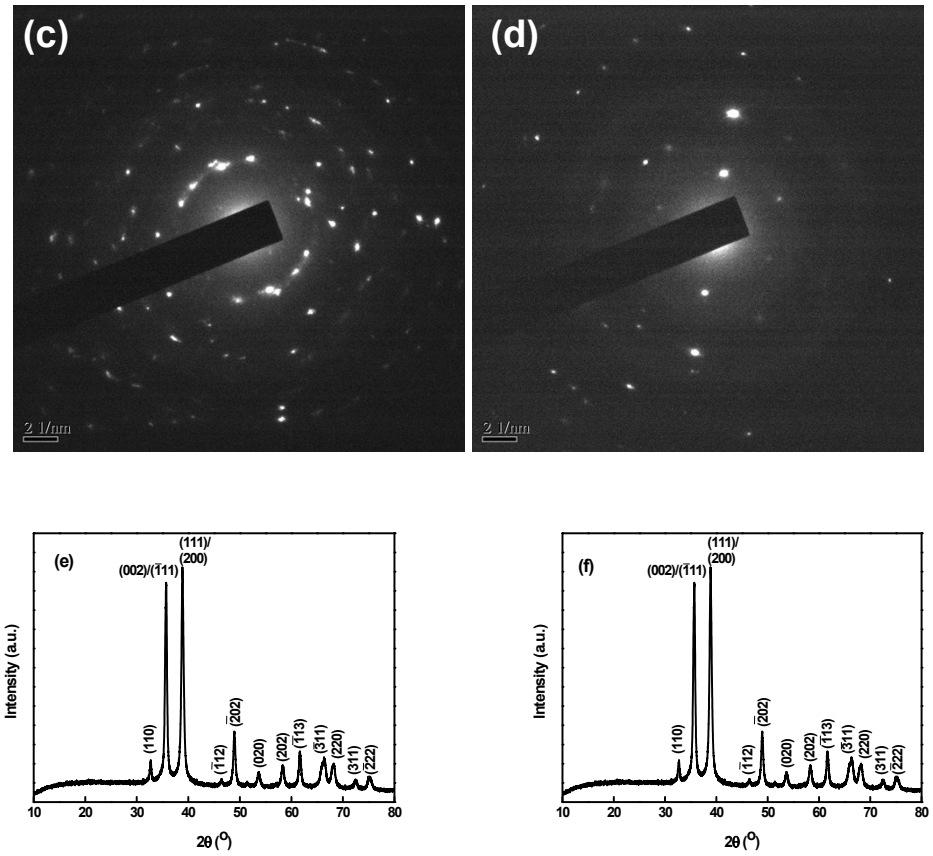


Figure S1. TEM image of CuO nanorods (S1) synthesized for (a) first time, (b) second time; SAED pattern of CuO nanorods recorded for (c) first time, (d) second time; XRD pattern of CuO nanorods synthesized for (e) first time, (f) second time respectively.

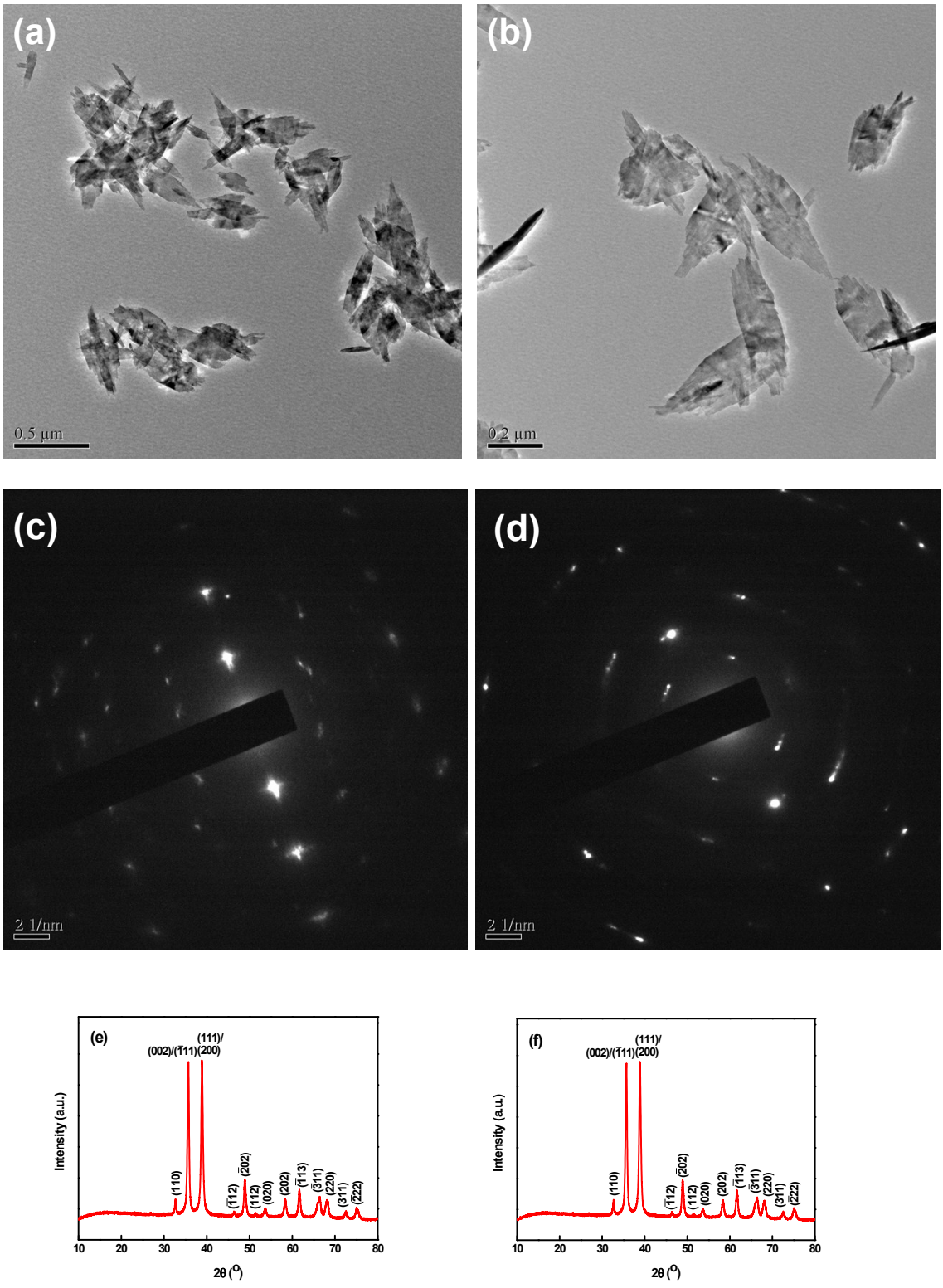


Figure S2. TEM image of CuO nanosheets (S2) synthesized for (a) first time, (b) second time; SAED pattern of CuO nanosheets recorded for (c) first time, (d) second

time; XRD pattern of CuO nanosheets synthesized for (e) first time, (f) second time respectively.

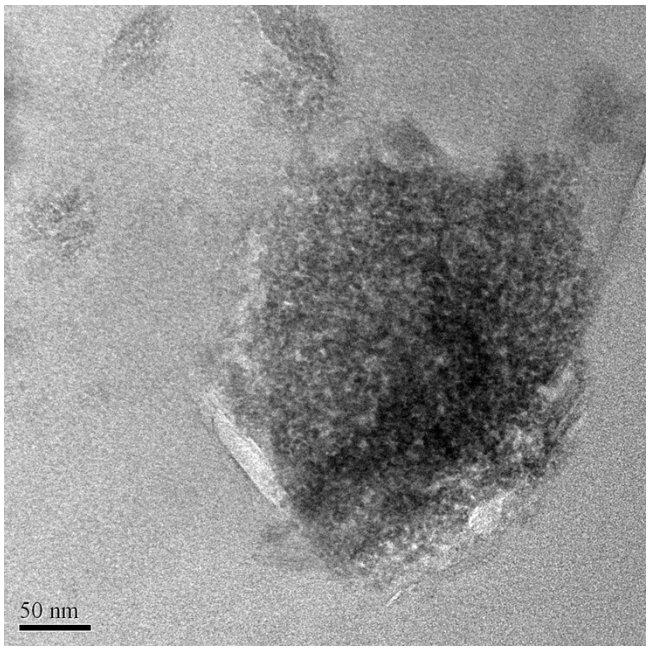


Figure S3. TEM image of CuO nanoparticles formed in the absence of aminoacids.

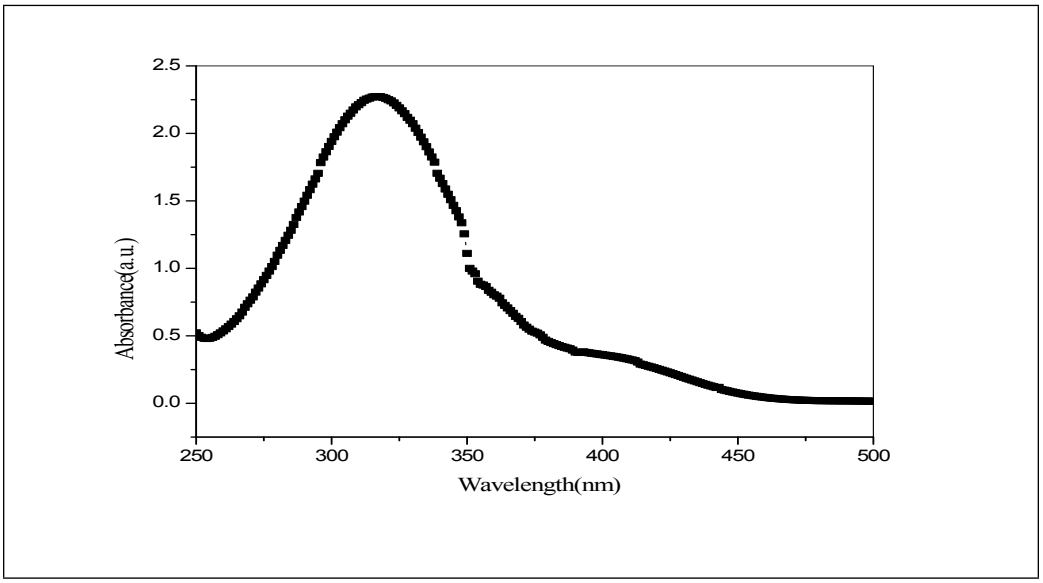


Figure S4. UV-visible spectra of 60µl (0.006 M) p-nitro phenol in aqueous medium

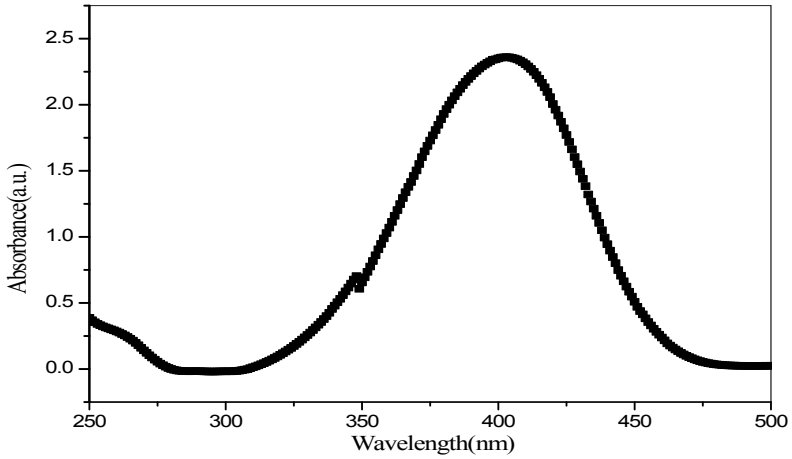


Figure S5. Absorption spectra of 60µl (0.006 M) PNP + 300 µl (0.1M) $NaBH_4$ in aqueous solution.

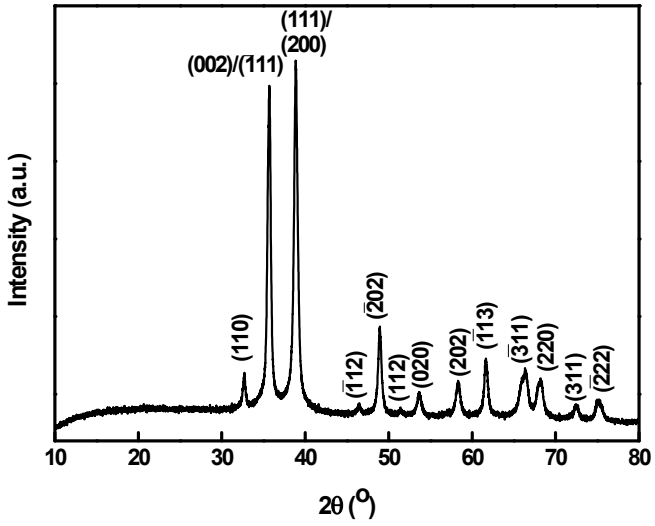


Figure S6. XRD pattern of exhausted CuO nanosheets after 5th cycle of operation as photocatalyst.

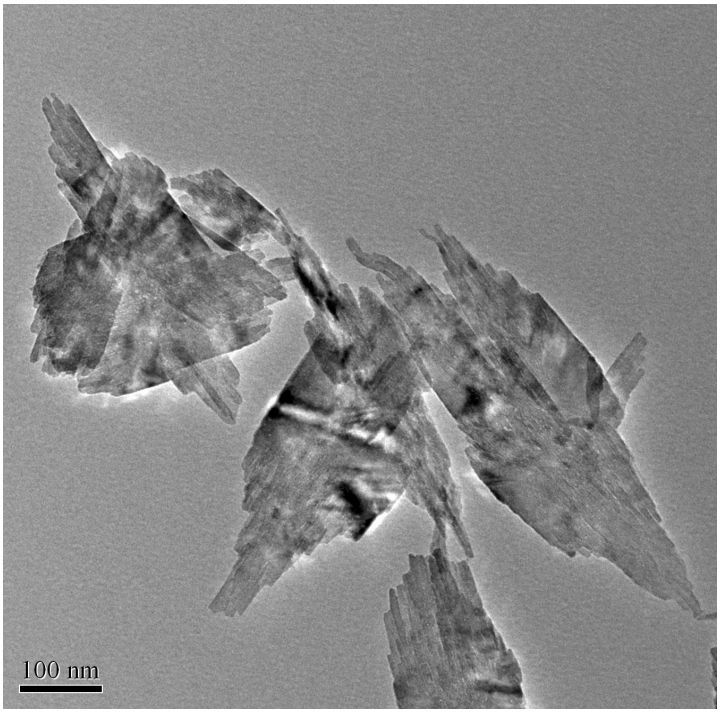


Figure S7. TEM image of exhausted CuO nanosheets after 5th cycle of operation as photocatalyst.

Table S1. Summary of the results obtained from TEM, XRD and SAED pattern for the synthesized CuO nanorods (S1) and CuO nanosheets (S2).

CuO nanoparticles	No. of times repeated	TEM (Particle size, nm)	SAED pattern (Crystal structure)	XRD pattern (Crystal Structure)
S1 (CuO nanorods)	First	Diameter= 30	Monoclinic	Monoclinic
	Second	Diamter= 30-31	Monoclinic	Monoclinic
S2 (CuO nanosheets)	First	Length= 300-600 Width= 200 Thickness= 30-60	Monoclinic	Monoclinic
	Second	Length= 300-600 Width= 200 Thickness= 30-60	Monoclinic	Monoclinic