Electronic Supplementary Information

Influence of CuO morphology on enhanced catalytic degradation of methylene blue and methyl orange

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Figure S1: TGA-patterns of the as synthesized $Cu_2(OH)_3Cl$ precursors.

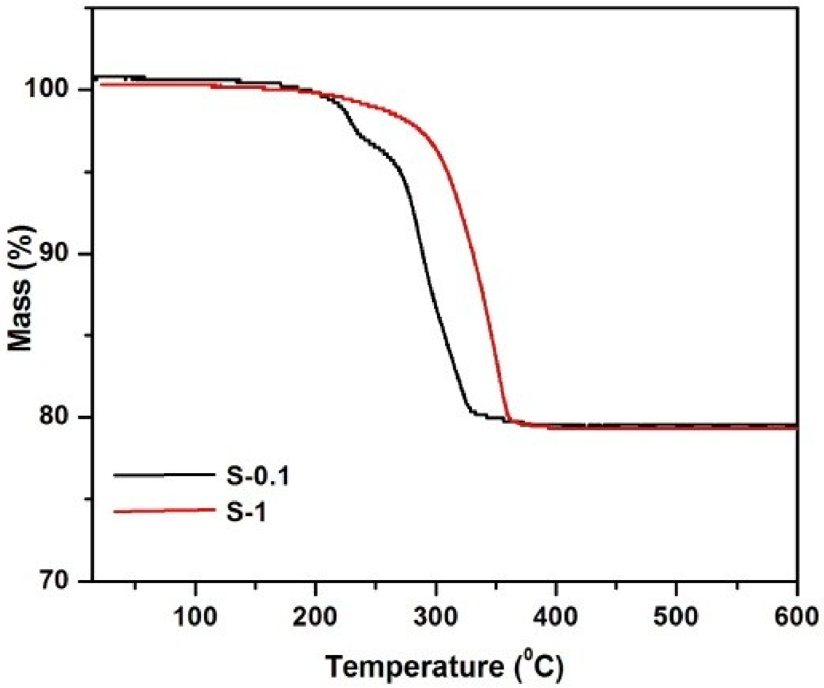

Figure S2: Electron image (a) and corresponding EDS elemental maps of Cu, O, and (Cu+O) (b-d), respectively of the as synthesized CuO sample S-0.1.

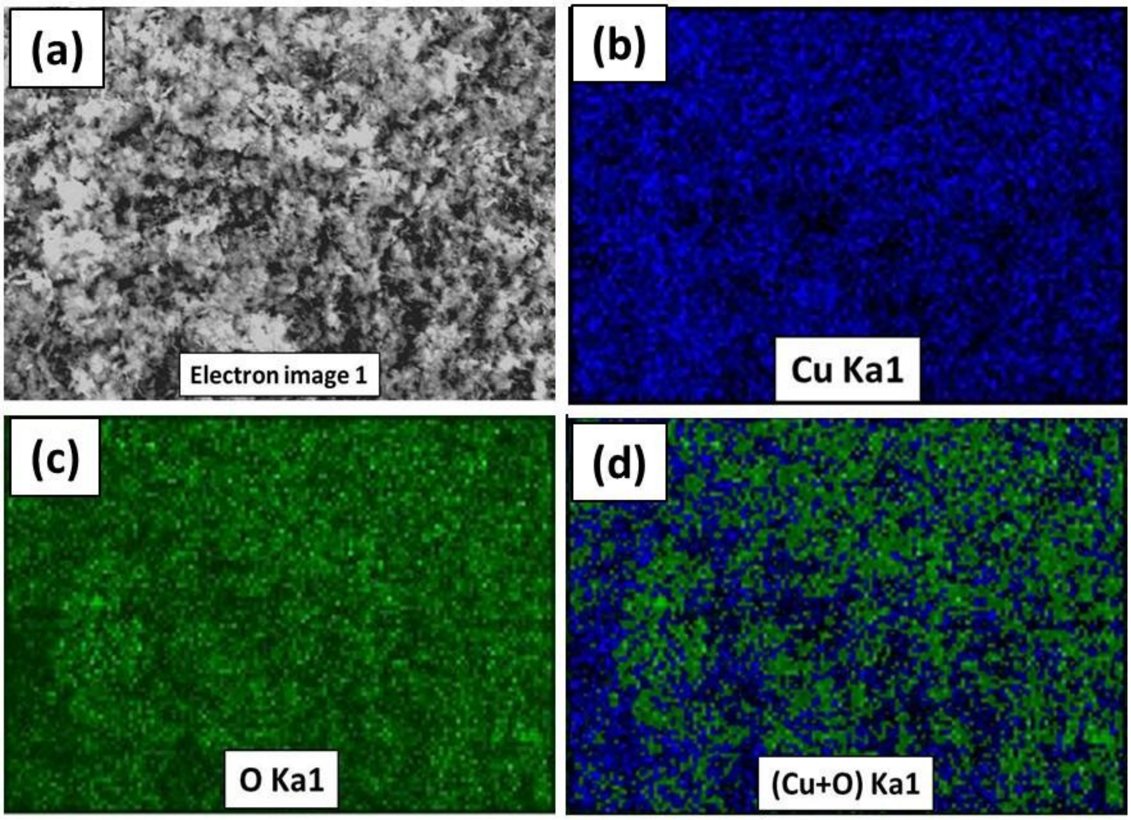

Figure S3: Electron image (a) and corresponding EDS elemental maps of O, Cu, and (Cu+O) (b-d), respectively of the as synthesized CuO sample S-1.

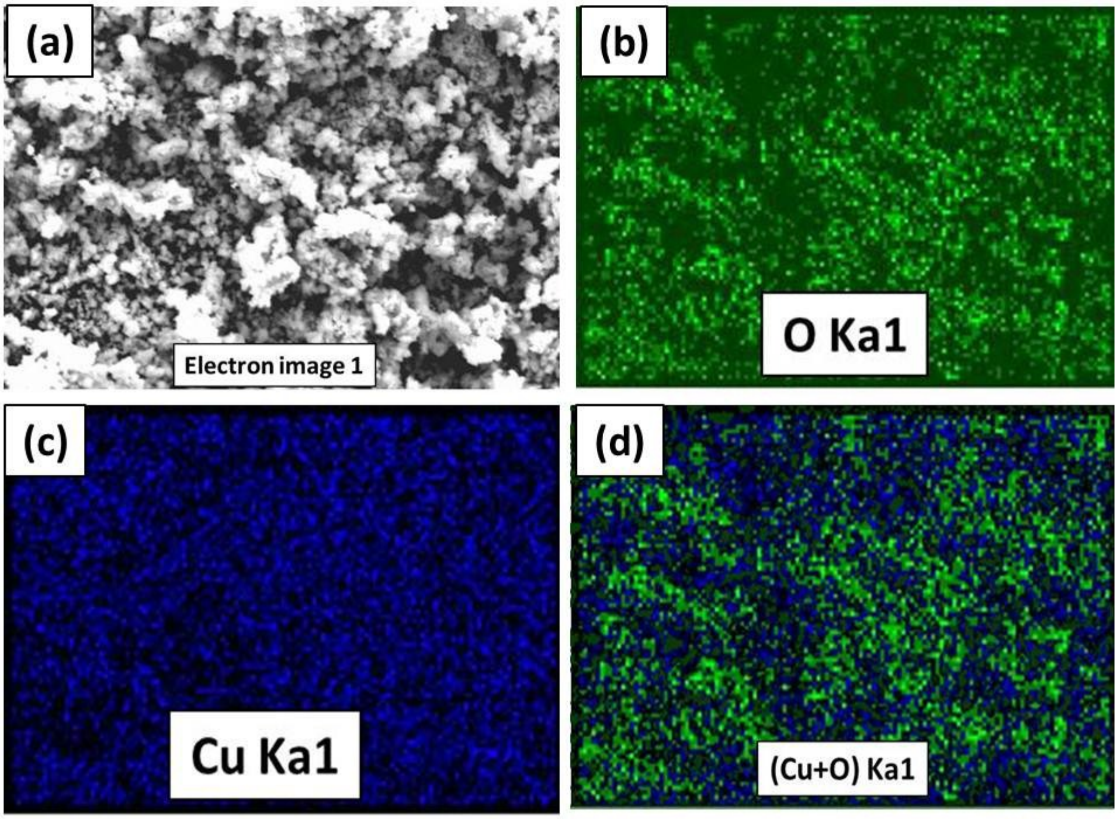

Figure S4: N_2 adsorption/desorption isotherm and pore size distribution curve of S-0.1 (a, b) and S-1 (c, d) CuO nanostructure, respectively.

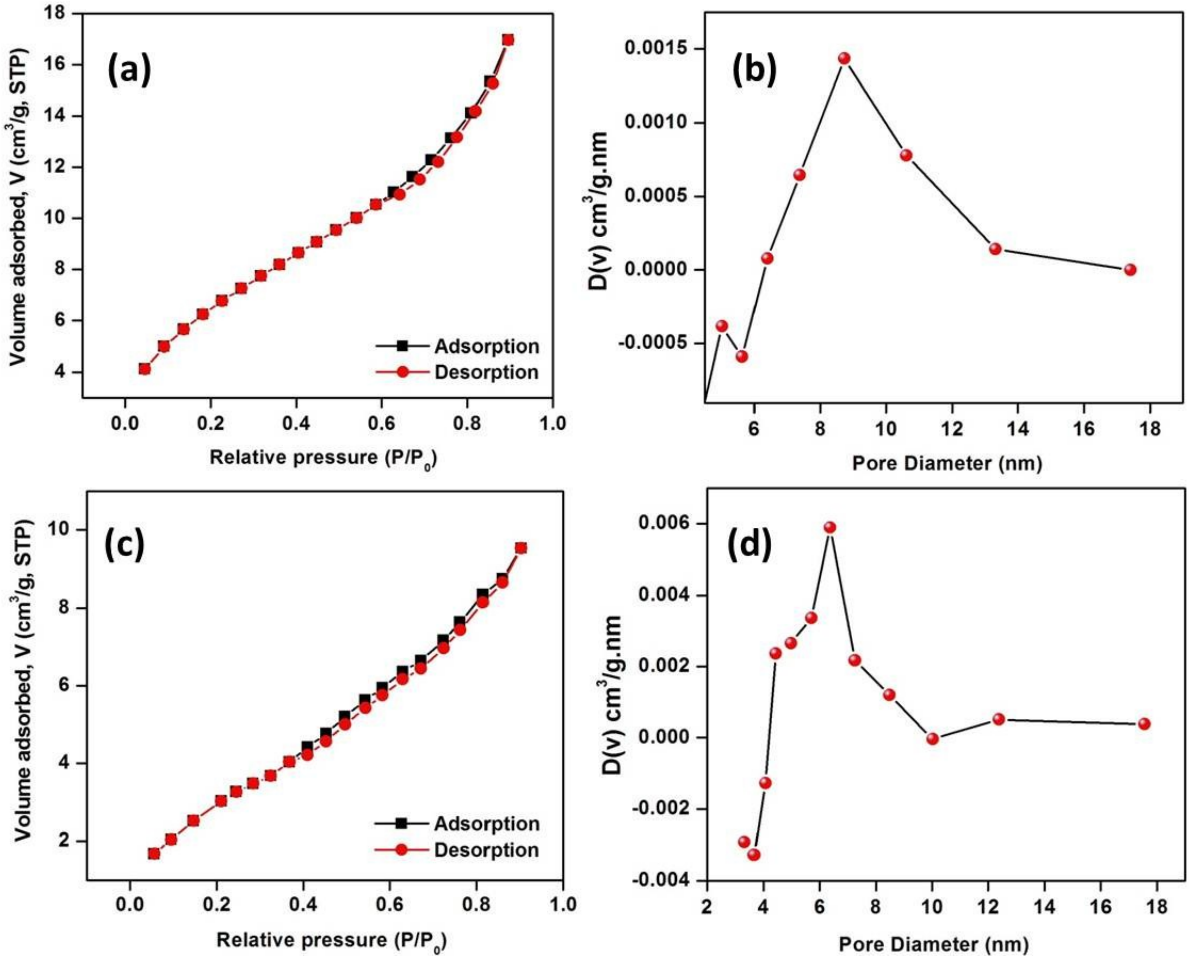

Figure S5: Time dependent UV-visible absorption spectra of reaction solutions of MB with only S-1 CuO (a), S-0.1 CuO (b), H_2O_2 (c), and MO with only S-1 CuO (d), S-0.1 CuO (e), and H_2O_2 (f), respectively. Conditions: [dye] = 5 mg/L, amount of dye solution = 10 mL, H_2O_2 = 1 mL, amount of catalyst = 3 mg and reaction temperature = 65 °C.

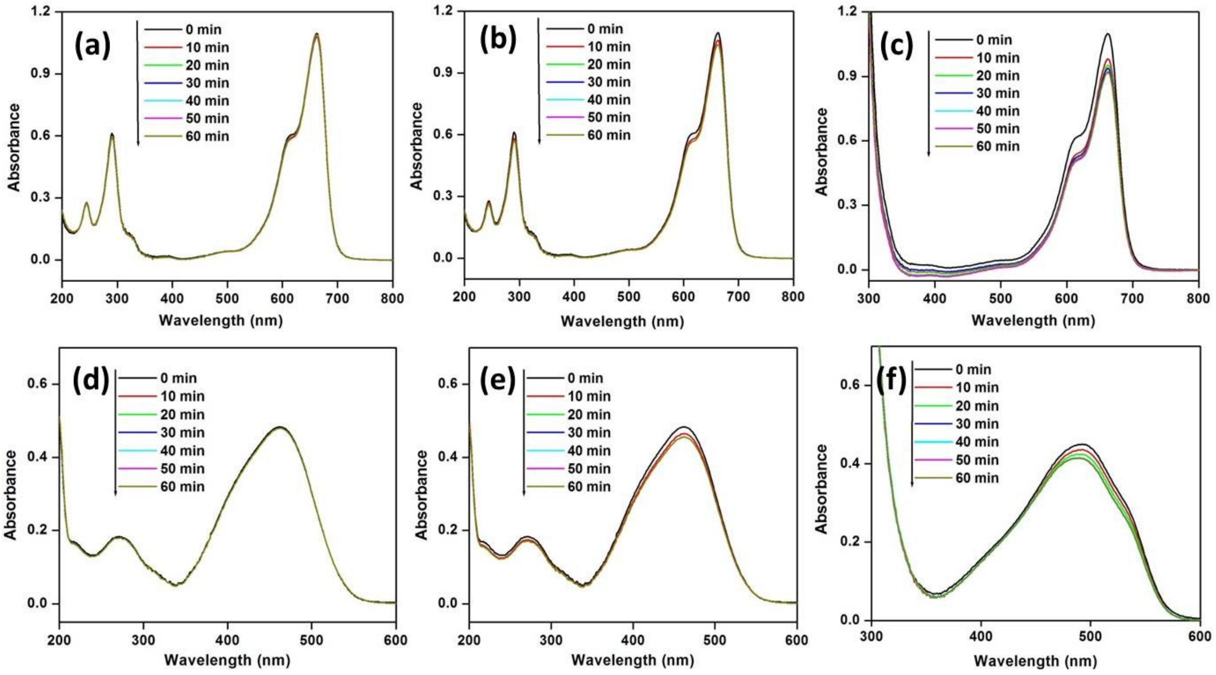

Figure S6: PL spectra of terephthalic acid solution in the presence of CuO nanostructres. The excitation wavelength is 325 nm. The PL is attributed to the production of •OH and subsequent 2-hydroxyterephthalic acid.

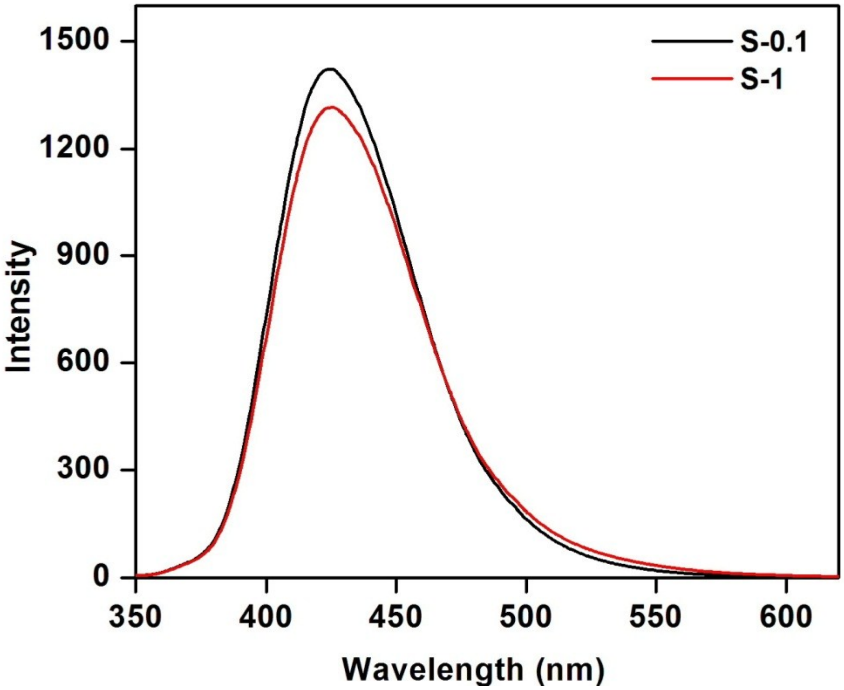

Figure S7: EDS of S-0.1 CuO (a, b) and S-1 CuO (c, d) after catalytic degradation of MB and MO, respectively; FTIR spectra of the CuO nanostructures after treating MB and MO (e).

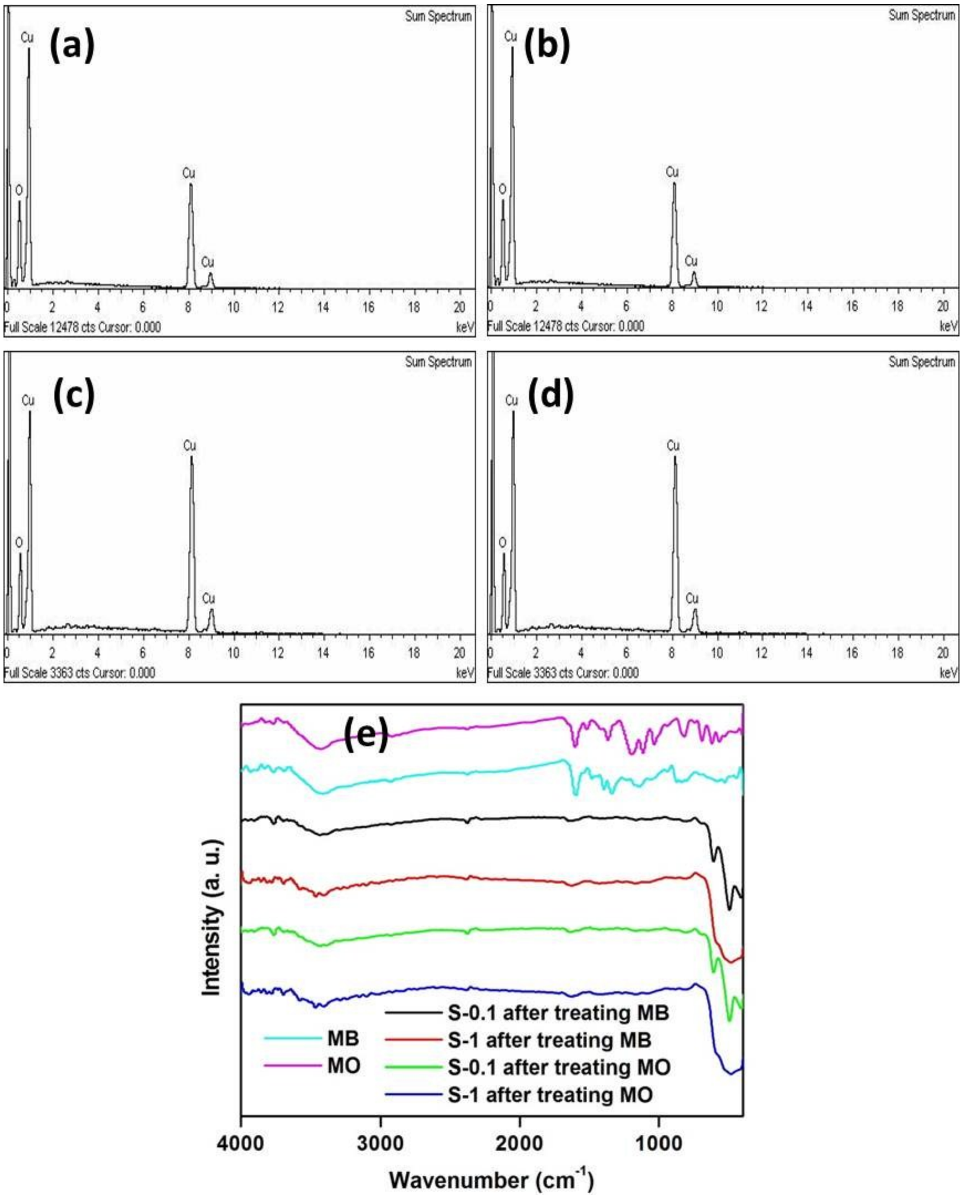

Figure S8: Time dependent UV-visible absorption spectra of reaction solutions of MB with S-0.1 CuO (a), S-1 CuO (b) at 25 °C and S-0.1 CuO (c), S-1 CuO (d) at 35 °C, respectively. Conditions: [dye] = 5 mg/L, volume of dye solution = 10 mL, H_2O_2 = 1 mL and amount of catalyst = 3 mg.

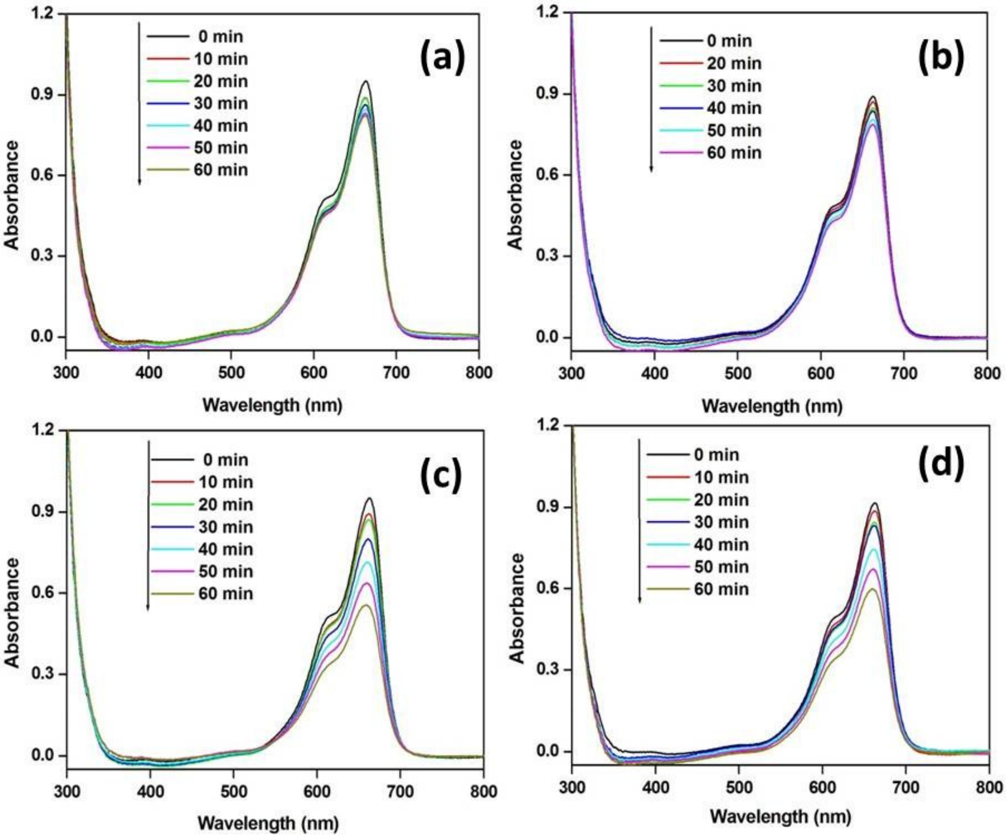

Figure S9: Time dependent UV-visible absorption spectra of reaction solutions of MO with S-0.1 CuO (a), S-1 CuO (b) at 25 °C and S-0.1 CuO (c), S-1 CuO (d) at 35 °C, respectively. Conditions: [dye] = 5 mg/L, volume of dye solution = 10 mL, H_2O_2 = 1 mL and amount of catalyst = 3 mg.

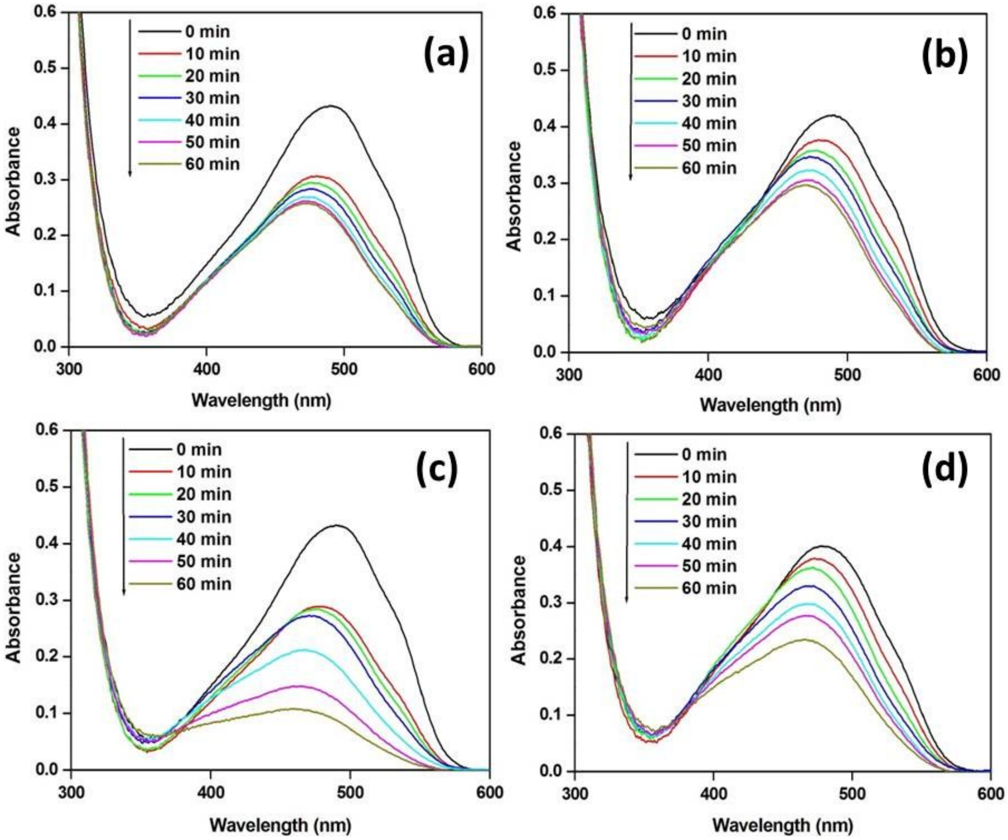

Figure S10: Time dependent UV-visible absorption spectra of reaction solutions of MB over S-0.1 CuO with catalyst dosage of 1 mg (a) and 6 mg (b) and S-1 CuO with catalyst dosage of 1 mg (c) and 6 mg (d), respectively. Conditions: [MB] = 5 mg/L, volume of MB solution = 10 mL, H_2O_2 = 1 mL and reaction temperature = 65 °C.

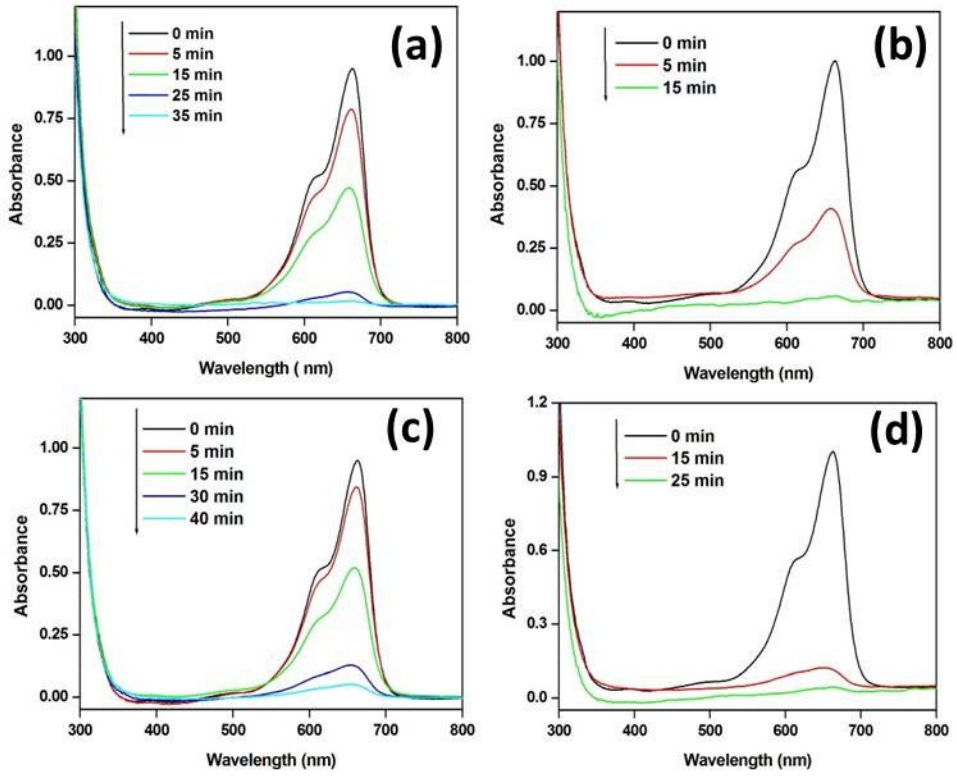

Figure S11: Time dependent UV-visible absorption spectra of reaction solutions of MO over S-0.1 CuO with catalyst dosage of 1 mg (a) and 6 mg (b) and S-1 CuO with catalyst dosage of 1 mg (c) and 6 mg (d), respectively. Conditions: [MO] = 5 mg/L, volume of MO solution = 10 mL, H_2O_2 = 1 mL and reaction temperature = 65 °C.

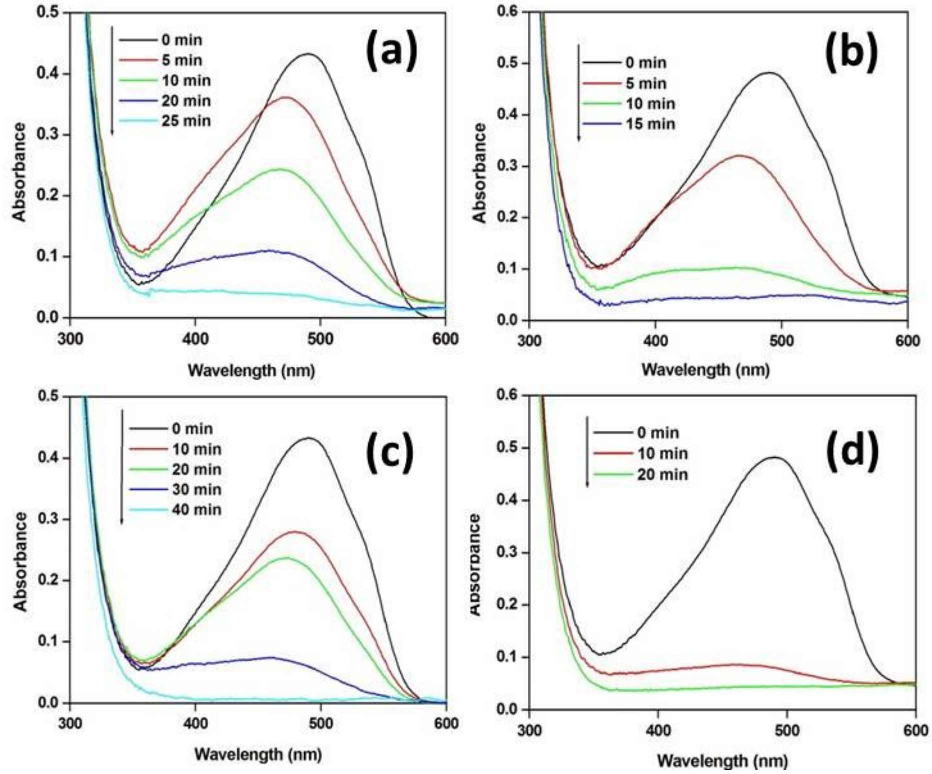

Figure S12: Time dependent UV-visible absorption spectra of degradation of MB over S-0.1 CuO for catalytic cycle 2 (a), cycle 3 (b), cycle 4 (c), and cycle 5 (d), respectively. Conditions: [MB] = 5 mg/L, volume of MB solution = 10 mL, H_2O_2 = 1 mL, amount of catalyst = 6 mg and reaction temperature = 65 °C.

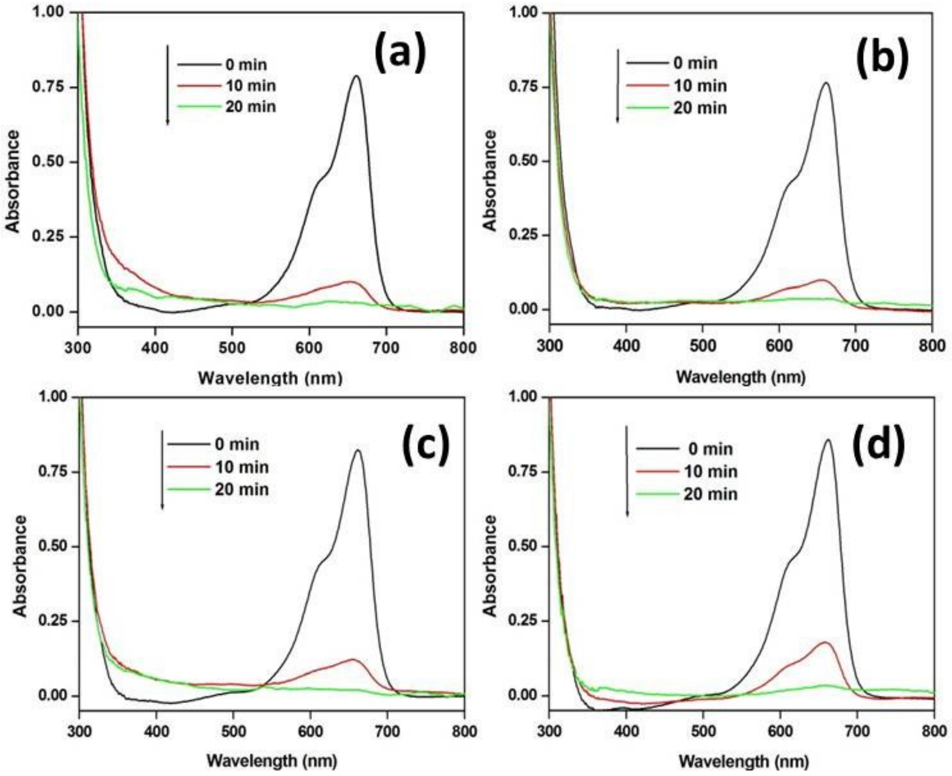

Figure S13: Time dependent UV-visible absorption spectra of degradation of MO over S-0.1 CuO for catalytic cycle 2 (a), cycle 3 (b), cycle 4 (c), and cycle 5 (d), respectively. Conditions: [MO] = 5 mg/L, volume of MO solution = 10 mL, H_2O_2 = 1 mL, amount of catalyst = 6 mg and reaction temperature = 65 °C.

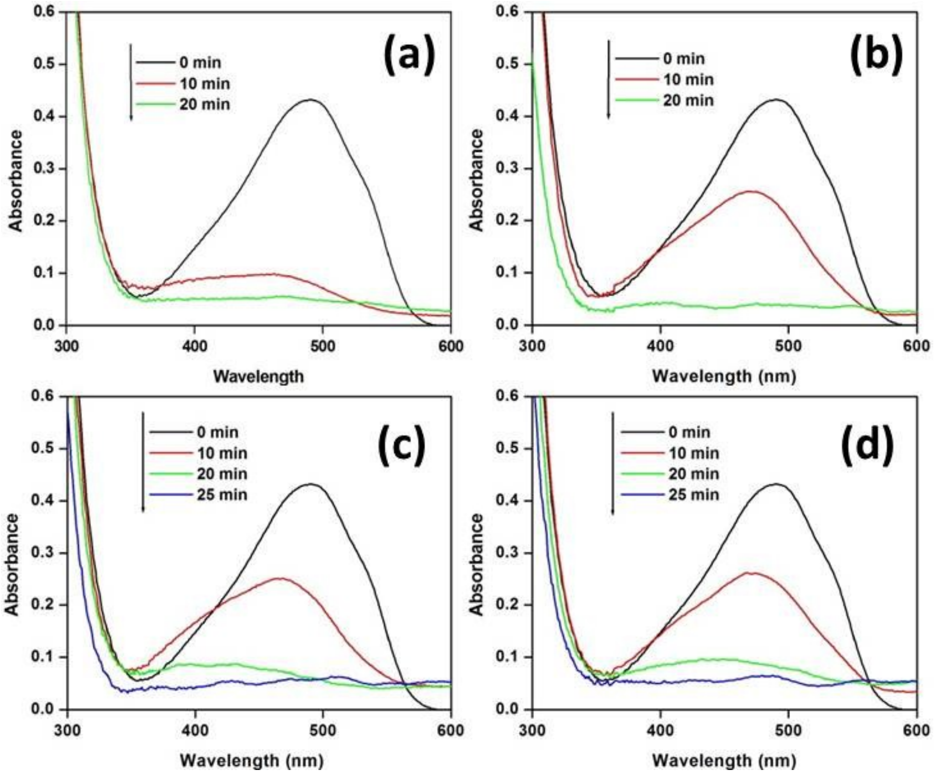

Figure S14: FTIR spectra of (a) dye molecules and (b) degradation products.