Supplementary Information

Light and Magnetism Dual Stimuli-Responsive Photoinduced Electron Transfer-Reversible Addition–Fragmentation Chain Transfer (PET-RAFT) Polymerization

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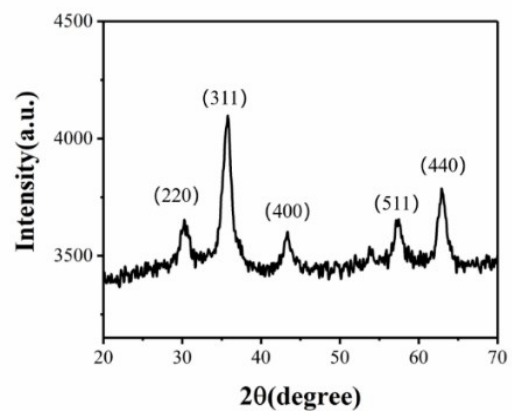

Figure S1. The XRD patterns of superparamagnetic γ-Fe_2O_3 nanoparticles.

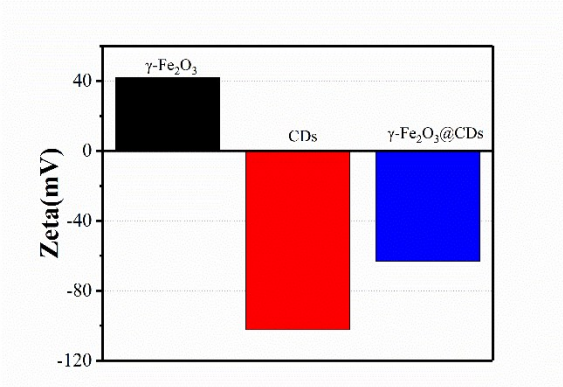

Figure S2. ζ Potential of γ-Fe_2O_3,CDs and γ-Fe_2O_3@CDs nanoparticles, respectively.

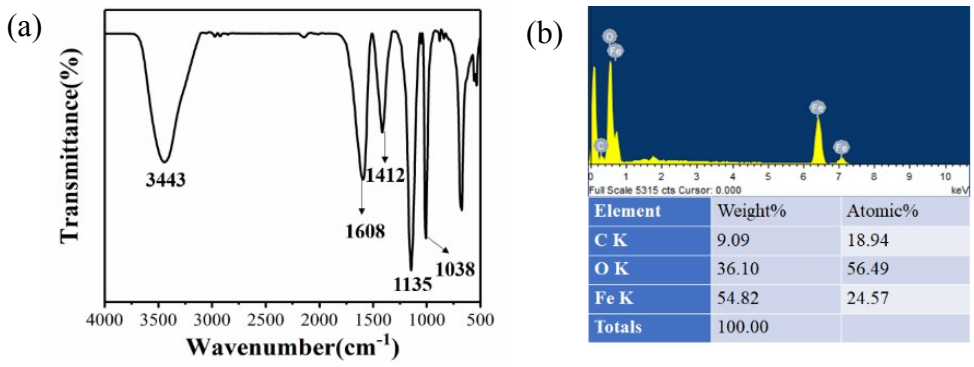

Figure S3. FTIR spectra and the EDS analysis of superparamagnetic γ-Fe_2O_3@CDs nanoparticles.

Figure S4. Representative photograph composed of reaction vial surrounded by the blue LEDs (A small fan was used to continuously blow air into the reaction system to fully dissipate the heat to maintain the reaction temperature at room temperature.).

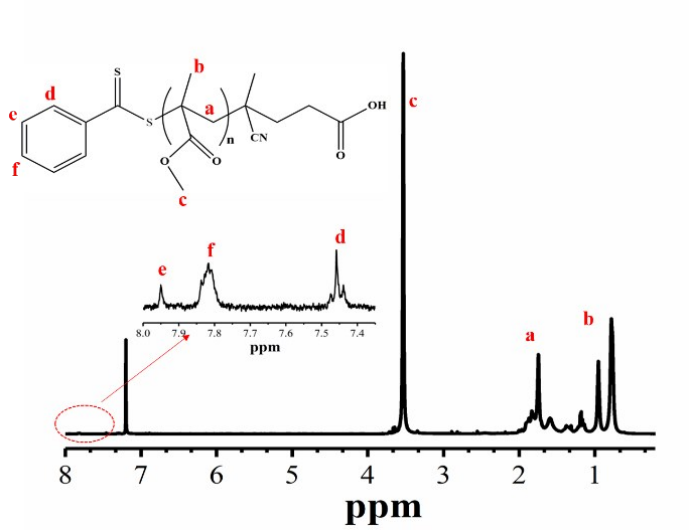

Figure S5. ^{1}H-NMR (300MHz, $CDCl_3$) of PMMA synthesized by PET-RAFT polymerization using γ-Fe_2O_3@CDs nanoparticles as photoredox catalyst.

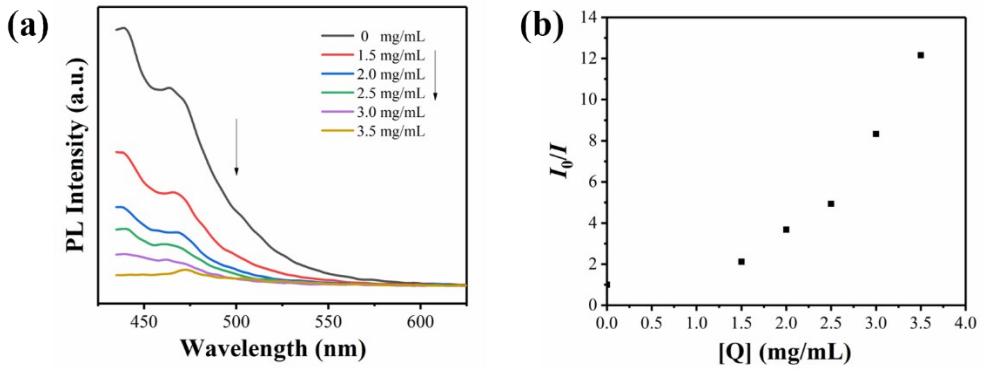

Figure S6. Fluorescence quenching study of γ-Fe_2O_3@CDs solution (10mg/mL) in DMSO with varying concentration of CPADB: (a) fluorescent emission intensity versus

different concentrations of CPADB; (b) plots of ratio I_0/I versus CPADB concentration. I_0 and I represent the emission intensity in the absence and presence of CPADB, respectively.

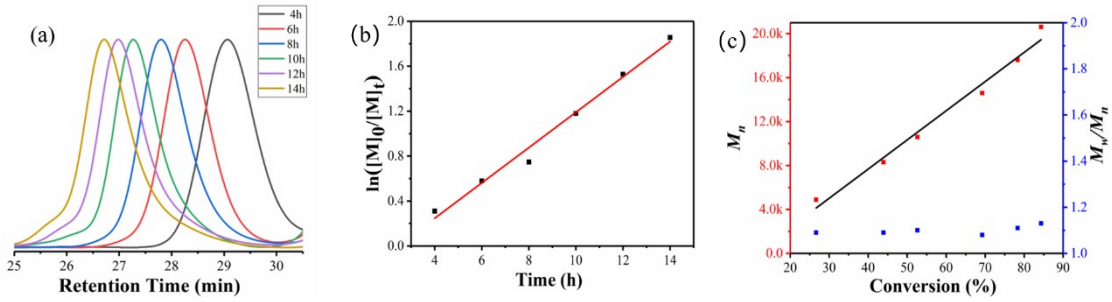

Figure S7. PET-RAFT polymerization of MA catalyzed by γ-Fe_2O_3@CDs under blue LED irradiation in DMSO at 25℃ under blue LED irradiation (6 W, λ_{max} = 460 nm, 2 mW/cm^2) with CDTPA as the CTA ([MA]/[CDTPA] = 200: 1). (a) GPC traces in the kinetic study of PMA synthesized *via* PET-RAFT polymerization. (b) Plot of ln$[M]_0$ /$[M]_t$ *versus* exposure time t. (c) Number-average molecular weight (M_n) and polydispersity index (PDI) of PMA synthesized in the kinetic study.

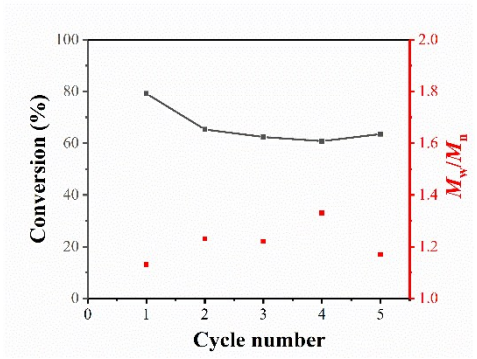

Figure S8. The average polymerization yields and polydispersity index (PDI) of PMMA after each PET-RAFT polymerization.