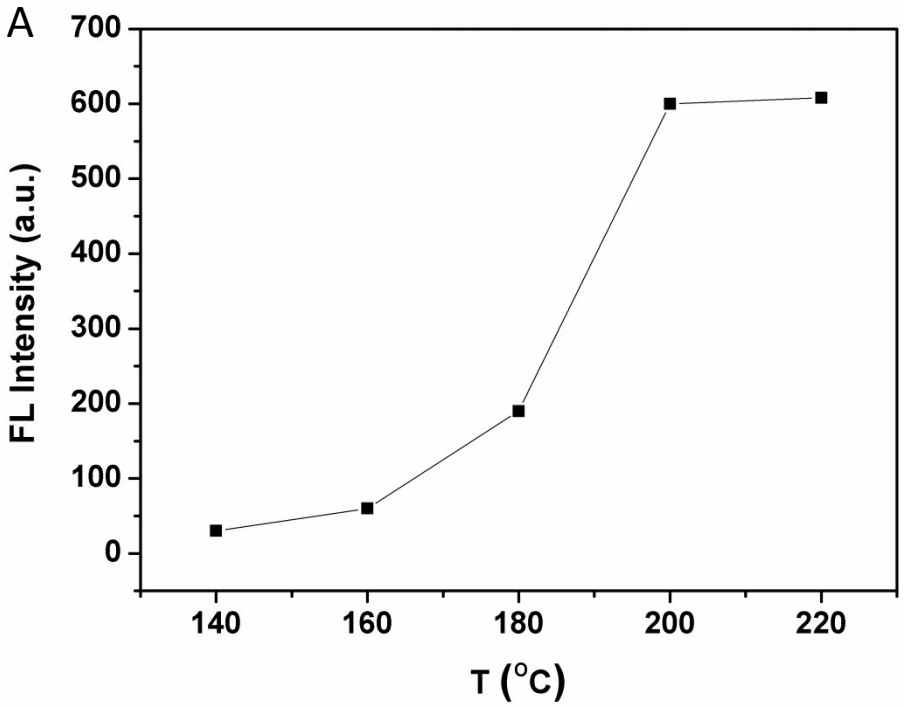
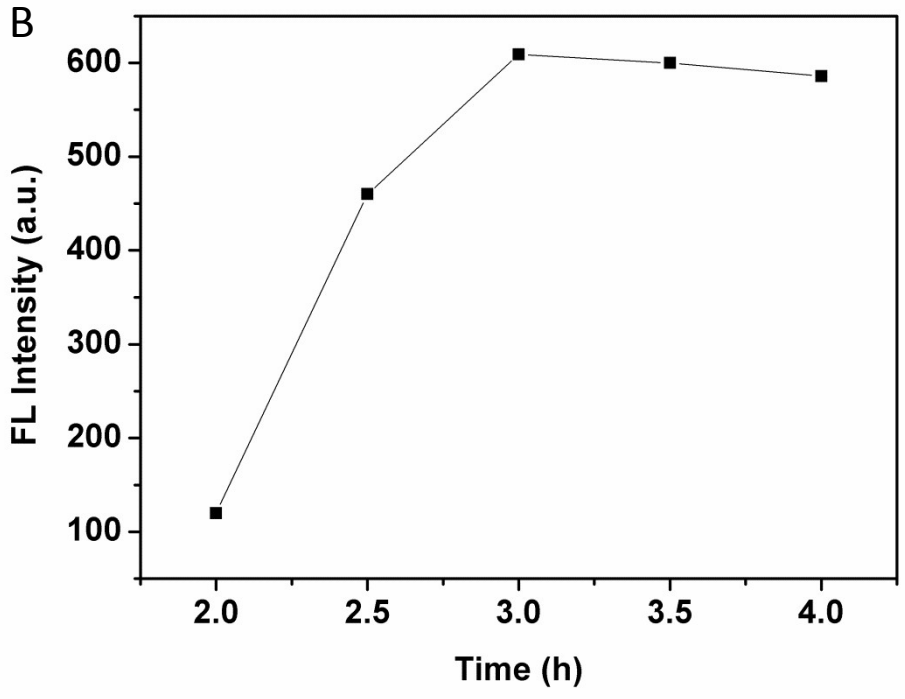
Electronic Supplementary Material (ESI) for New Journal of Chemistry.





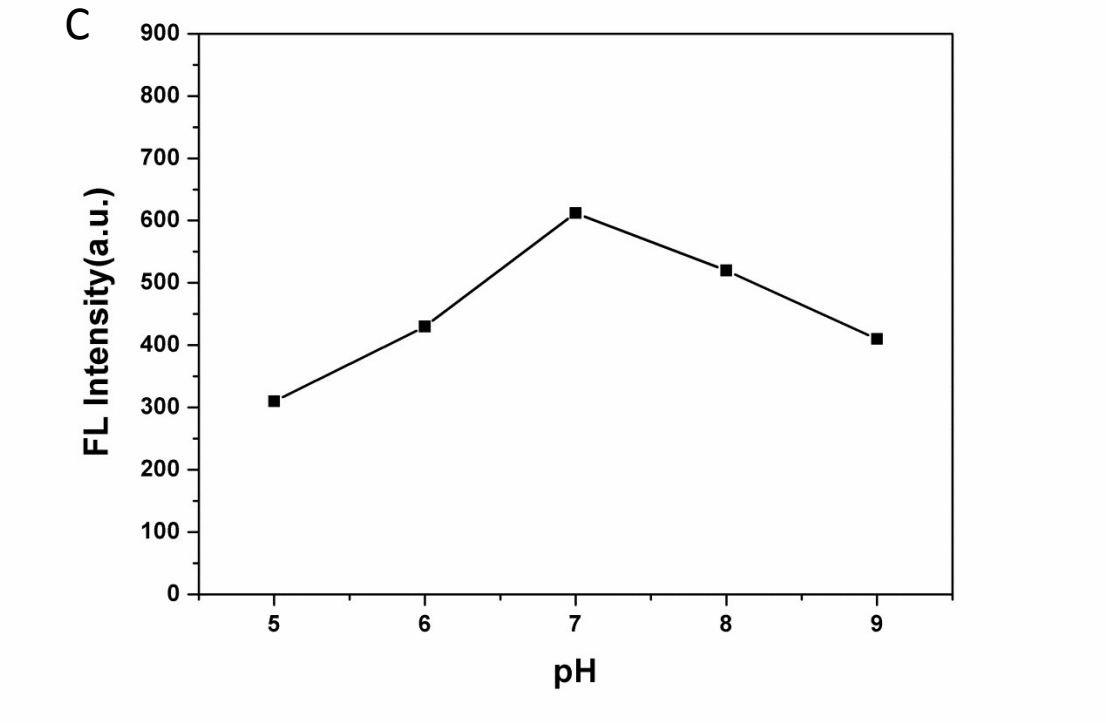
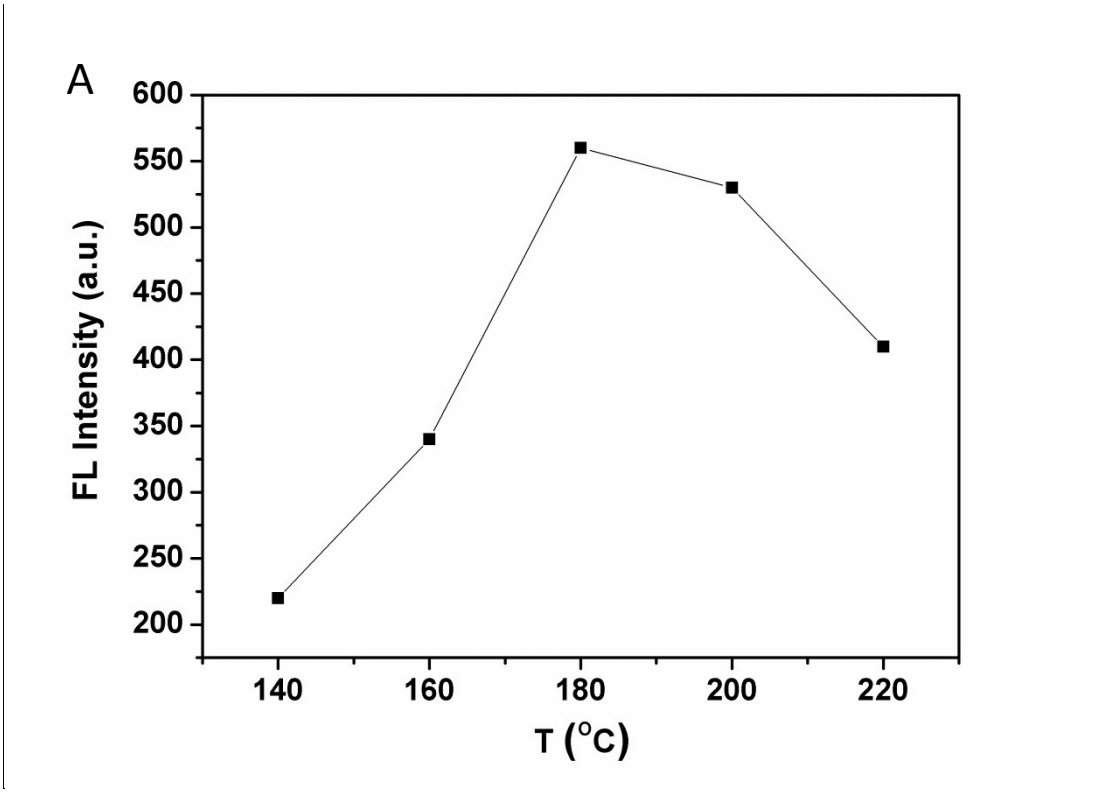
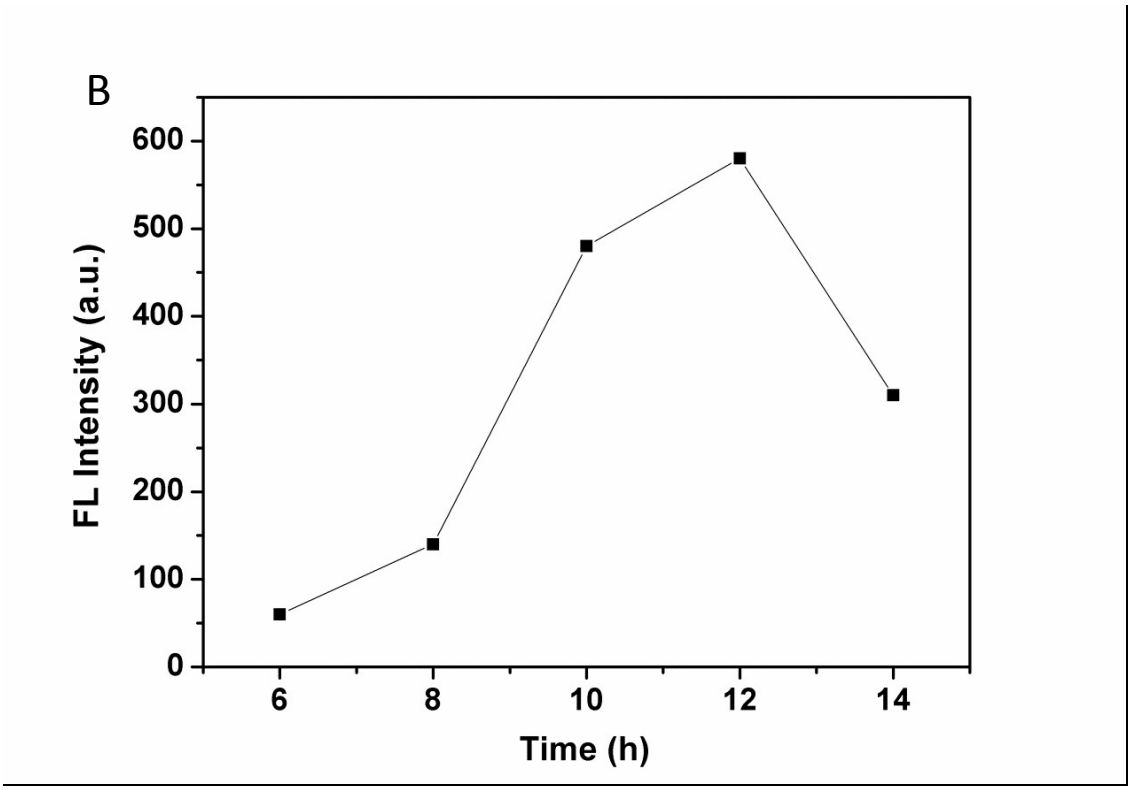


Figure S1. Effect of (A) temperature (B) time and (C) pH on the fluorescence intensity of B-CDs





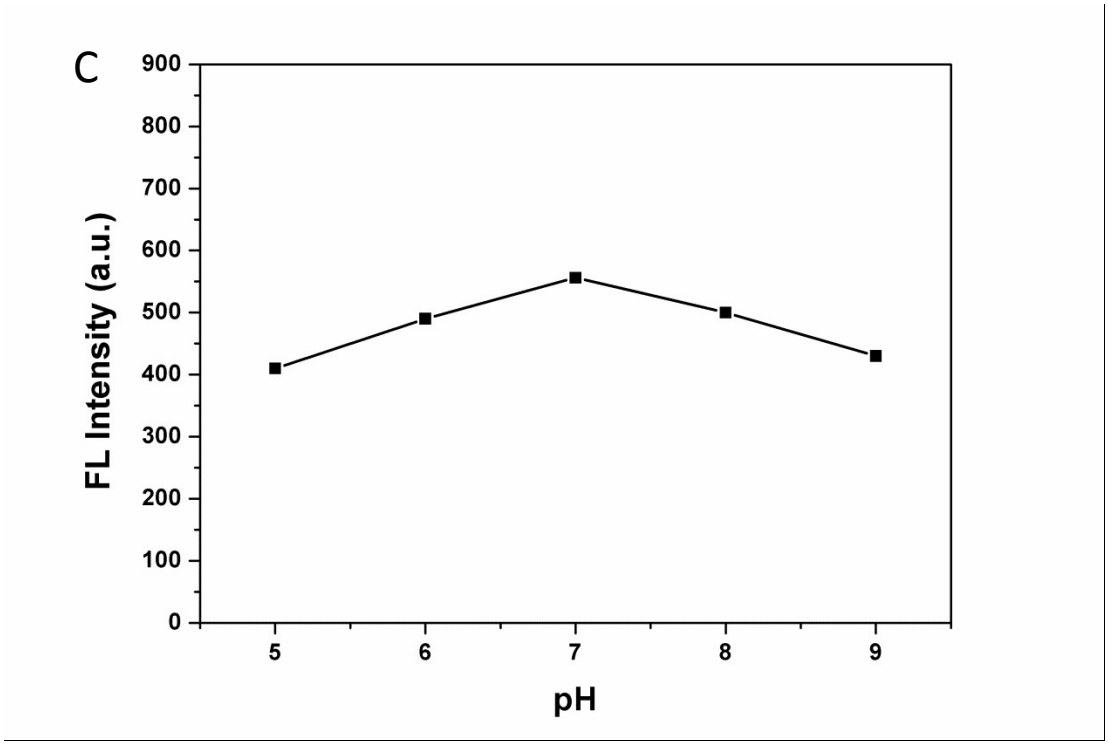


Figure S2. Effect of (A) temperature (B) time and (C) pH on the fluorescence intensity of R-CDs

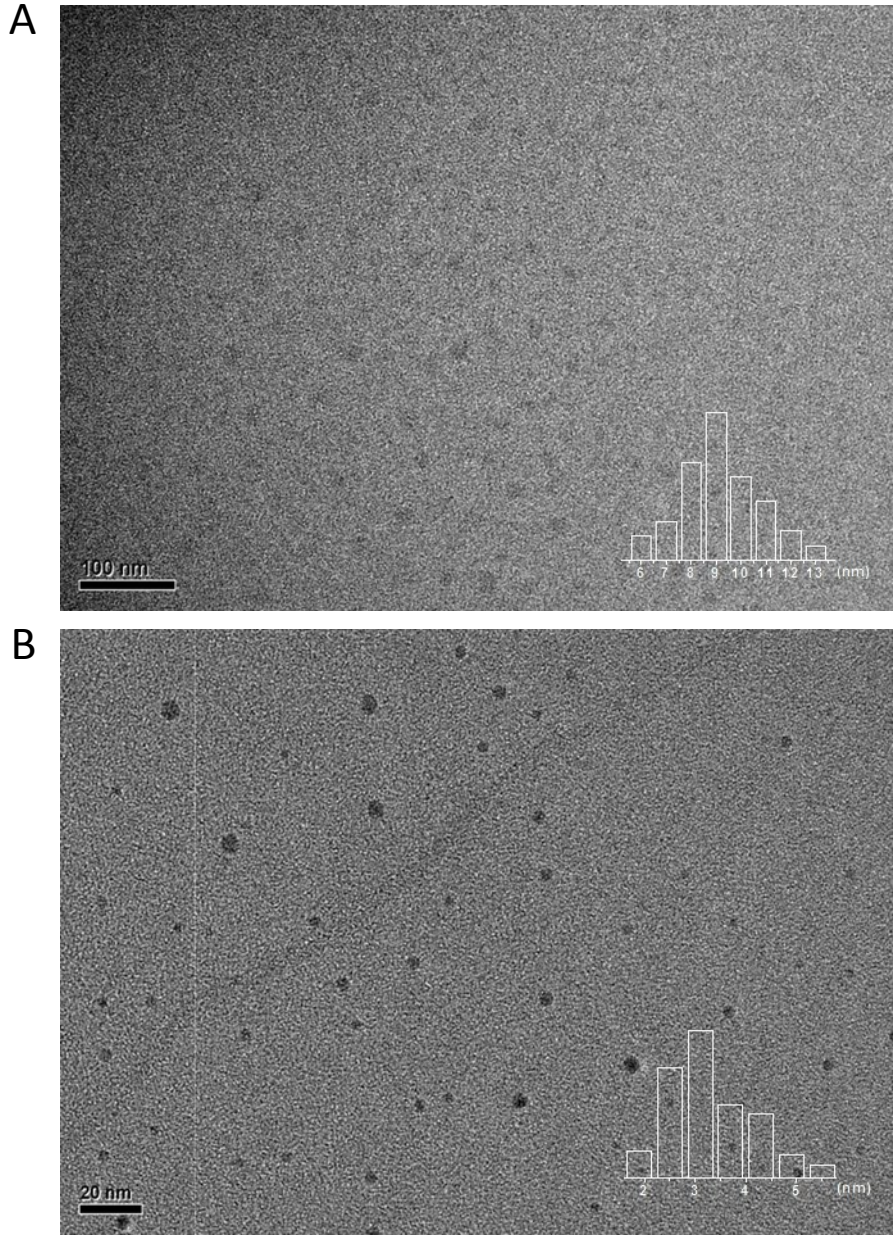


Figure S3. (A) TEM image of B-CDs (The inset is the size distribution of B-CDs), (B) TEM image of R-CDs (The inset is the size distribution of R-CDs).

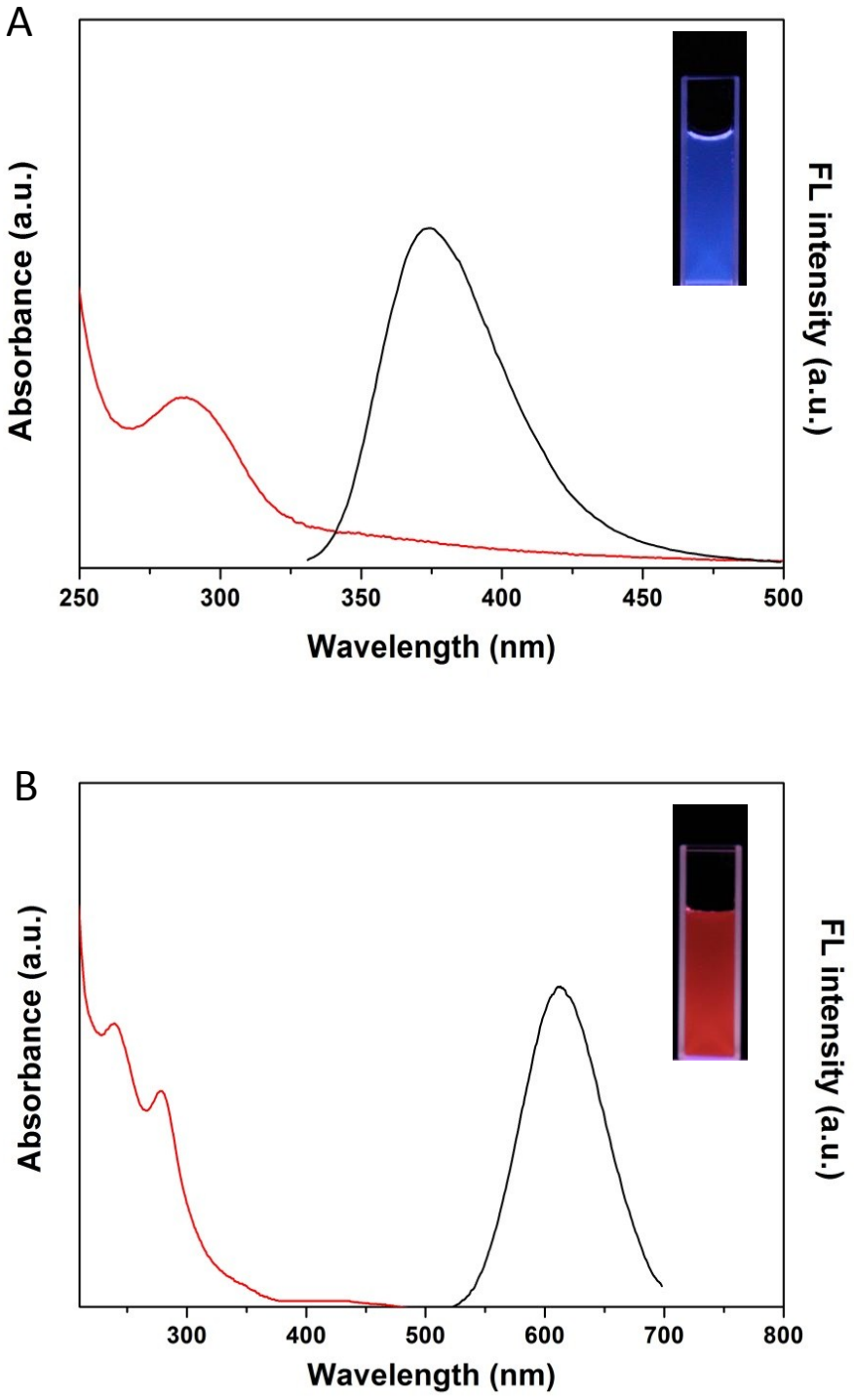


Figure S4. (A) UV-vis absorbance and fluorescent emission of B-CDs (The inset show the corresponding color under a 254 nm UV lamp). (B) UV-vis absorbance and fluorescent emission of R-CDs (The inset show the corresponding color under a 254 nm UV lamp).

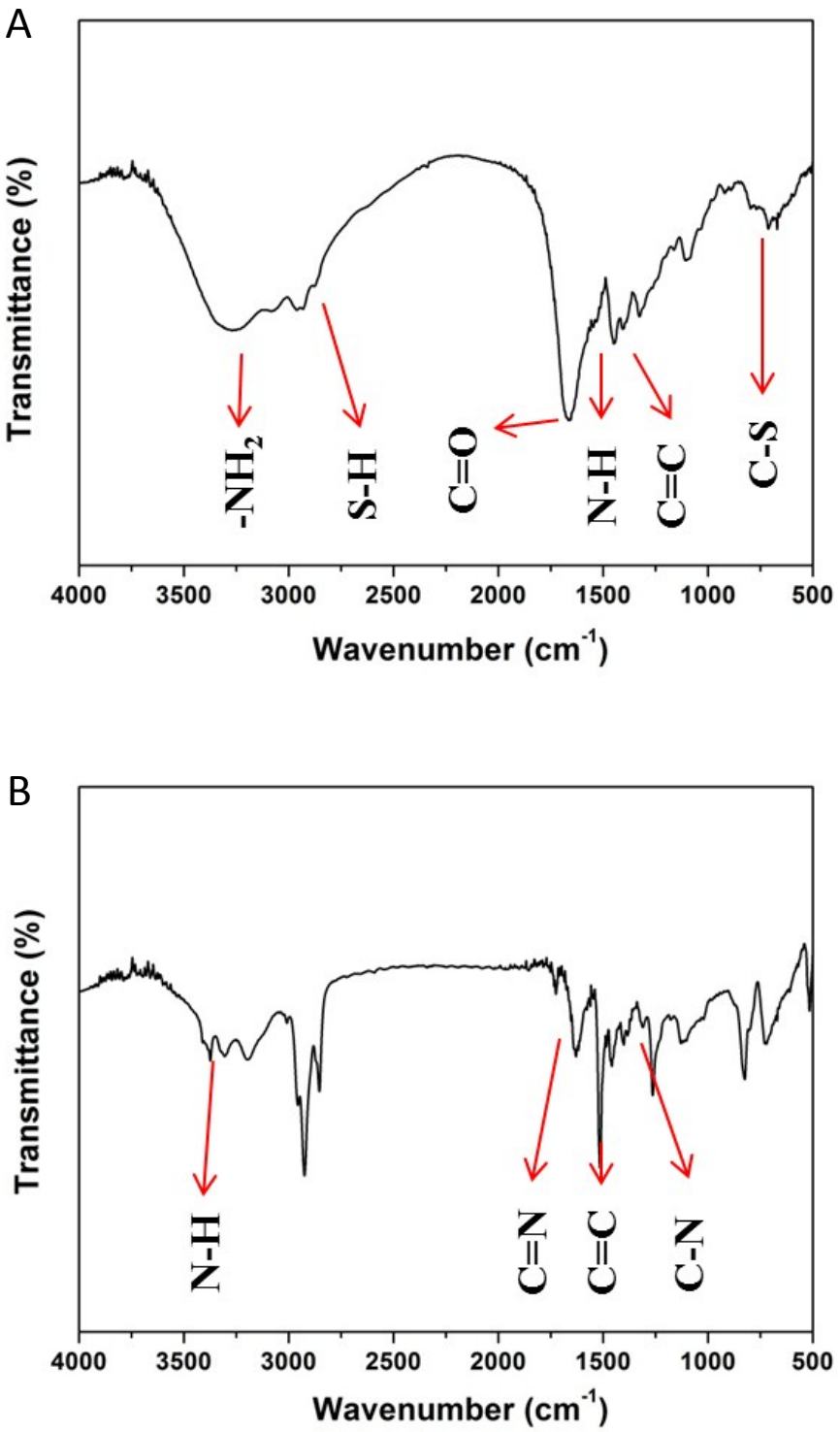


Figure S5. The FT-IR spectra (A) of B-CDs and (B) of R-CDs.

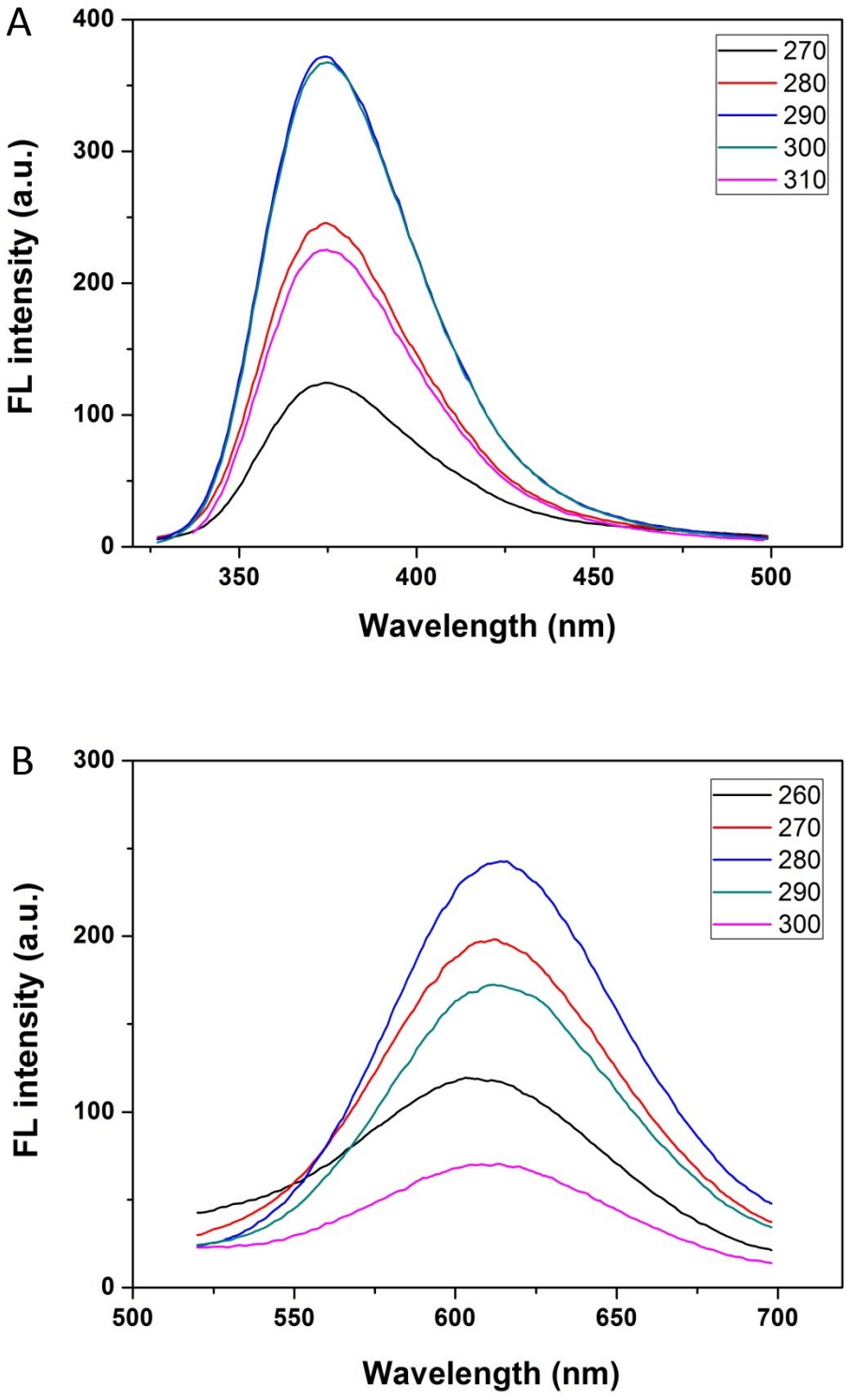


Figure S6. (A) FL spectra of the B-CDs excited at different wavelengths, (B) FL spectra of the R-CDs excited at different wavelengths.

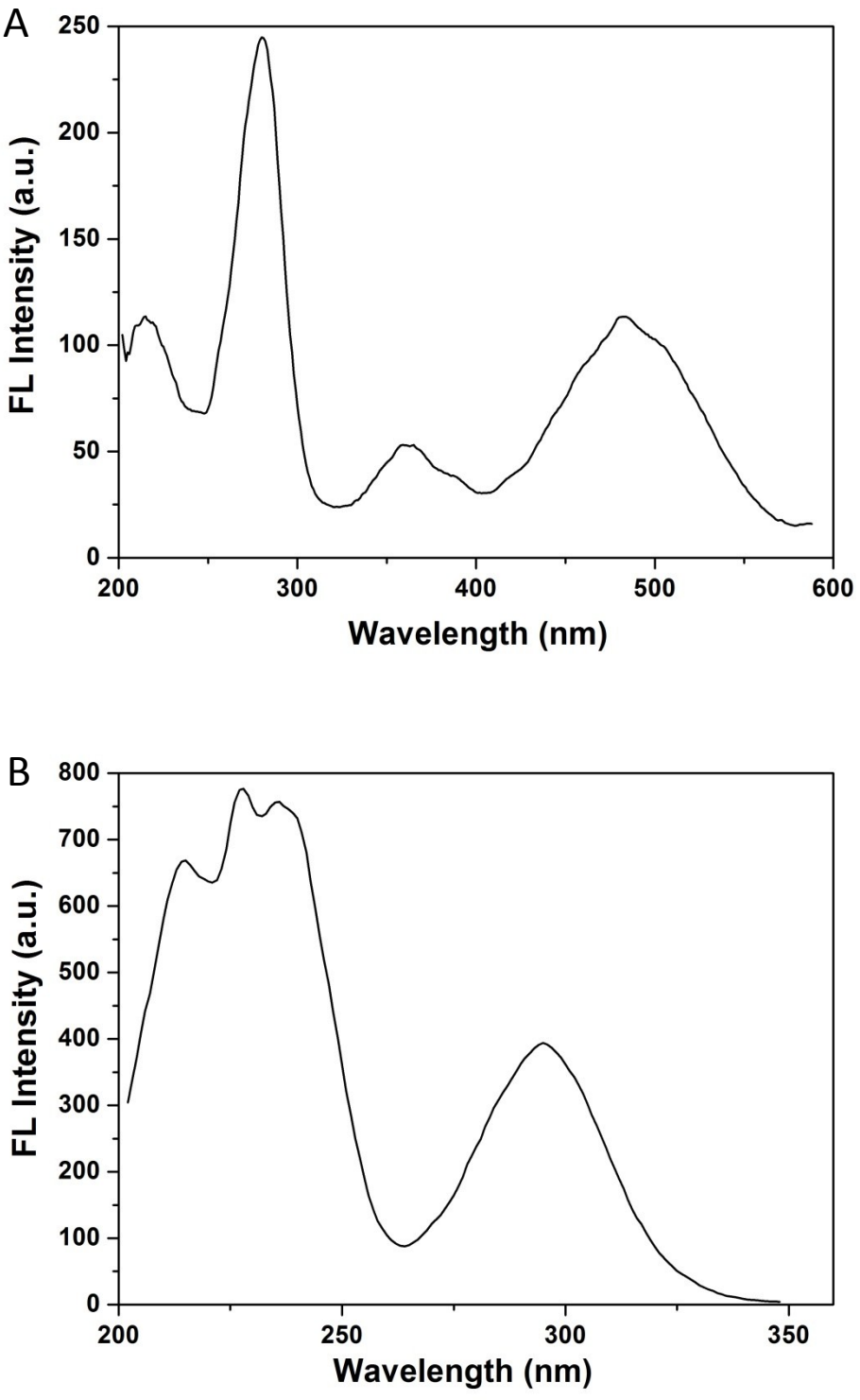


Figure S7. The excitation spectrum (A) of B-CDs and (B) of R-CDs.

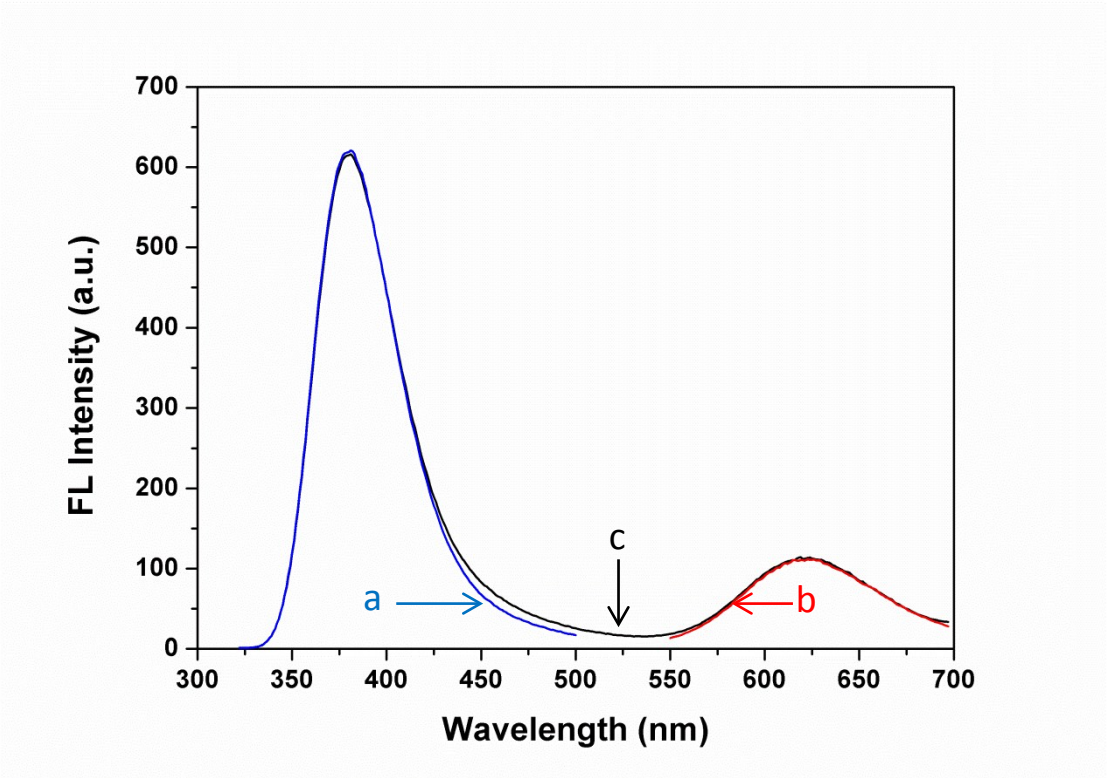


Figure S8. Fluorescence emission spectra (λ_{ex} = 290 nm) of (a) B-CDs, (b) R-CDs and (c) mixing B-CDs and R-CDs, respectively.

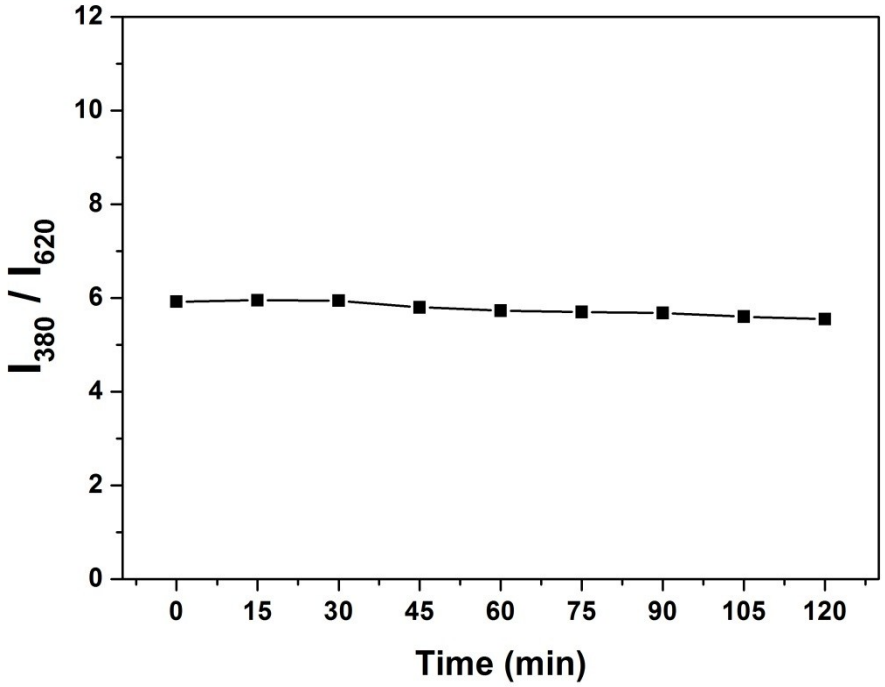


Figure S9. Photostability of the ratiometric fluorescence I_{380}/I_{620} of mixing B-CDs/R-CDs with the time exposed to 254 nm ultraviolet light for 15 min each time (I_{380} and I_{620} are the fluorescence intensities of B-CDs and R-CDs, respectively).

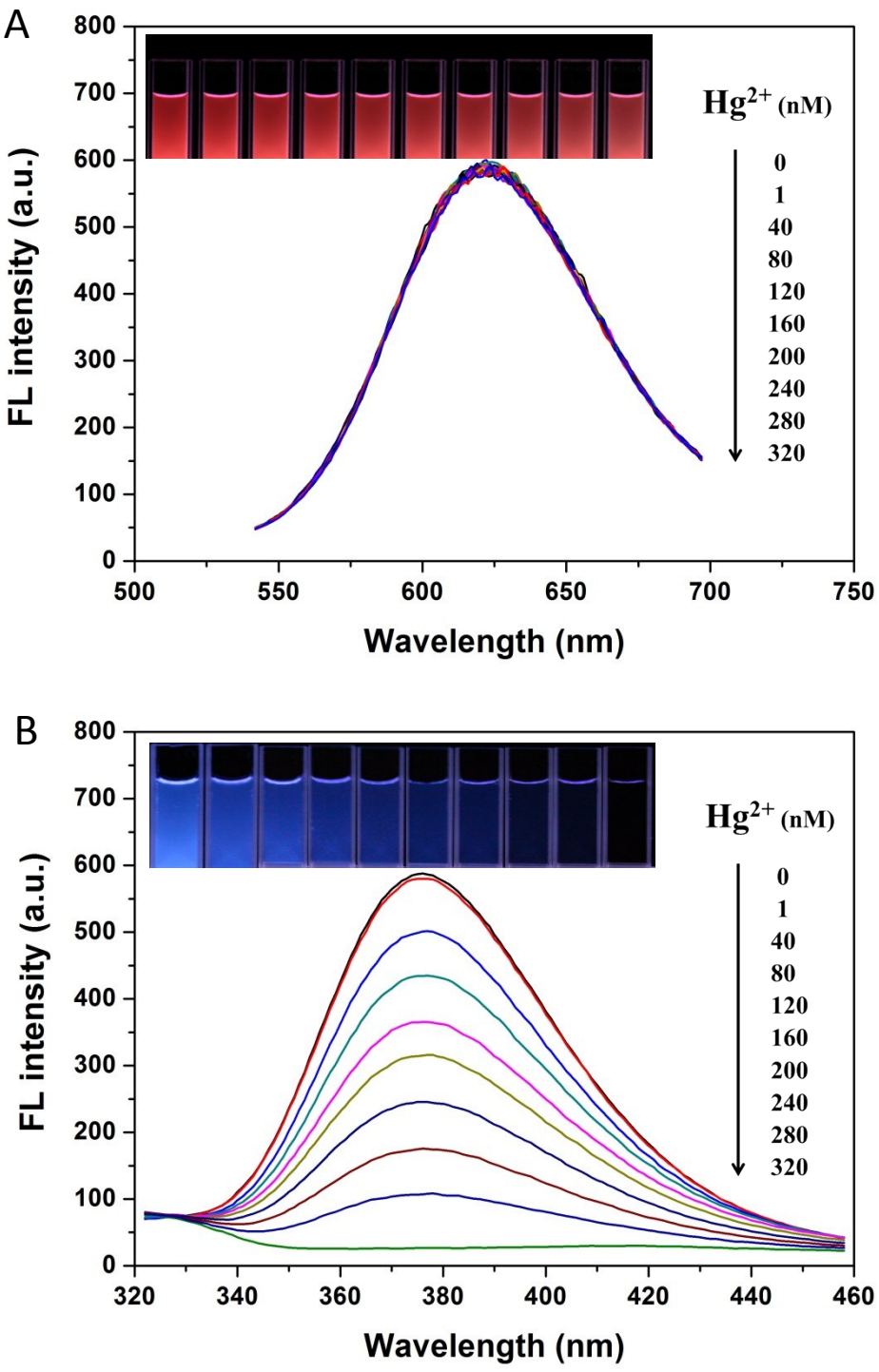


Figure S10. The fluorescent emission spectra (λ_{ex}= 290 nm) of (A) R-CDs and (B) B-CDs with the addition of Hg^{2+}. The inset photos show the corresponding color evolutions under a 254 nm UV lamp.

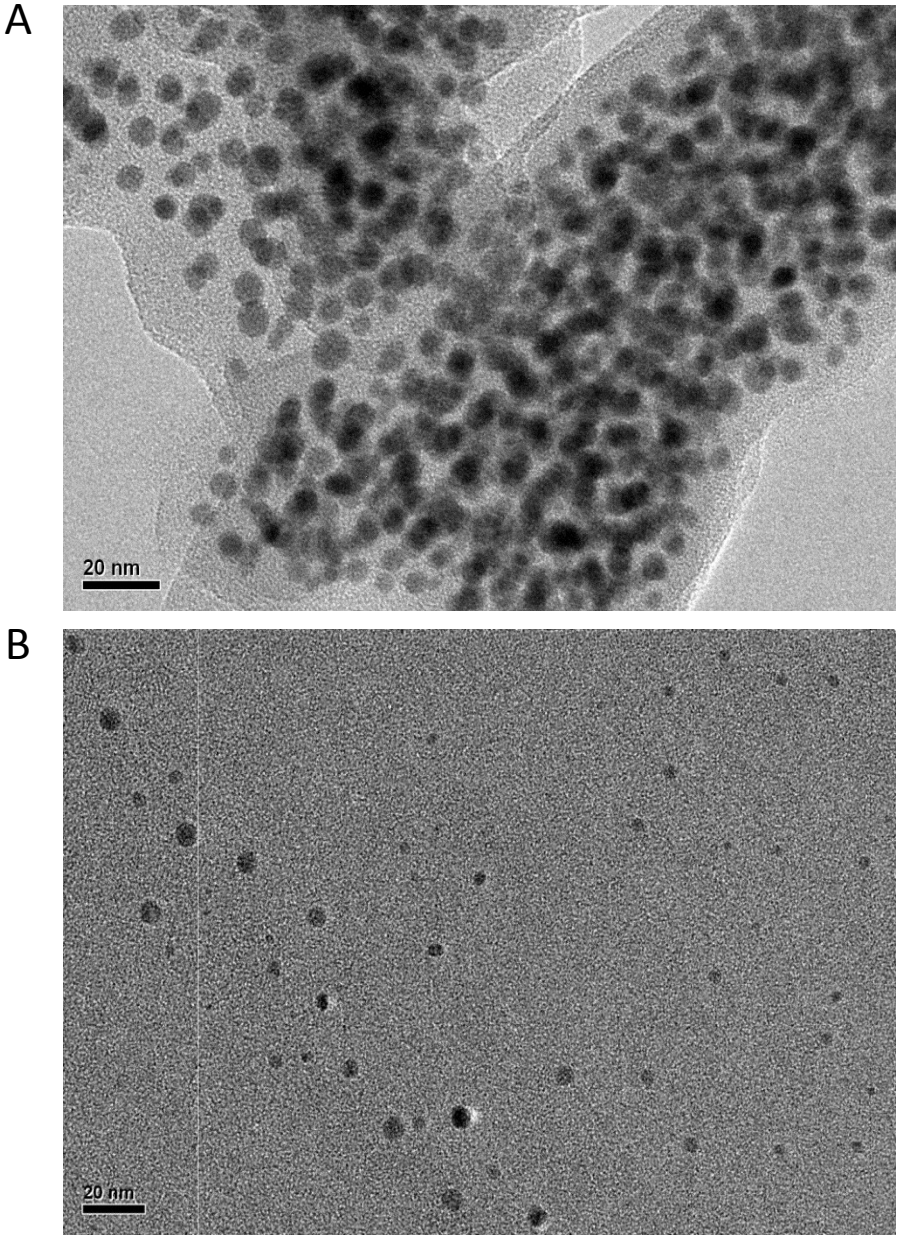


Figure S11. The TEM image of (A) B-CDs and (B) R-CDs with the addition of 320 nM Hg^{2+}.

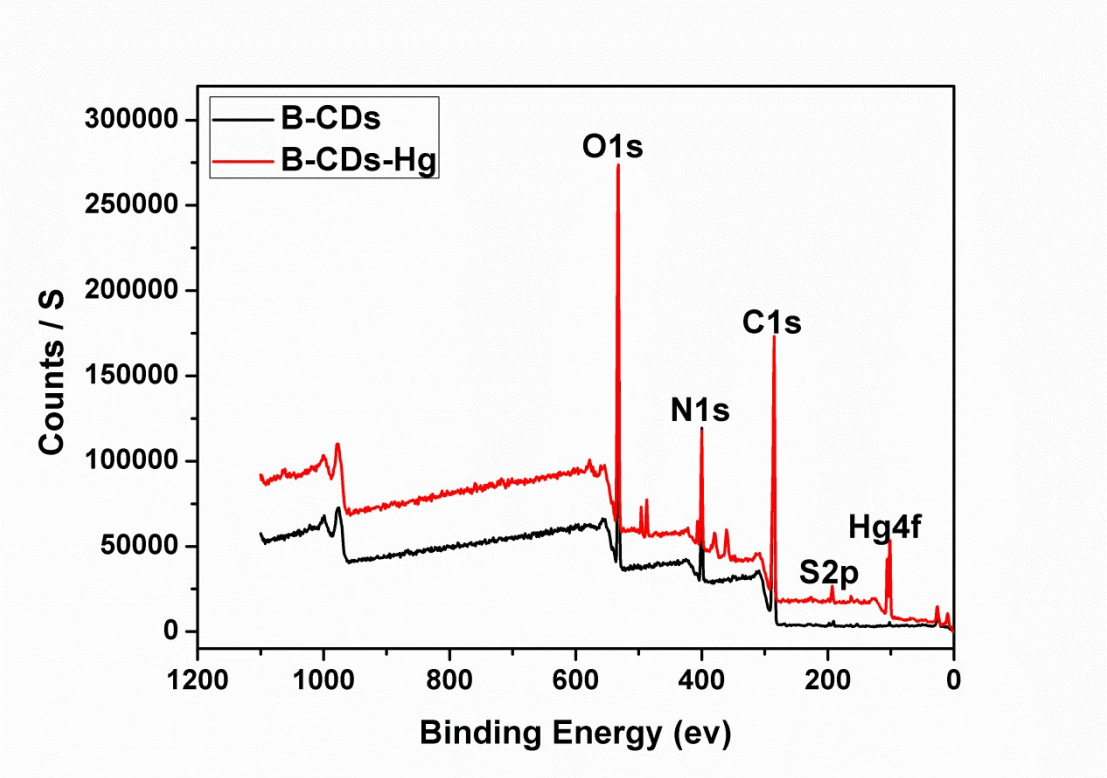
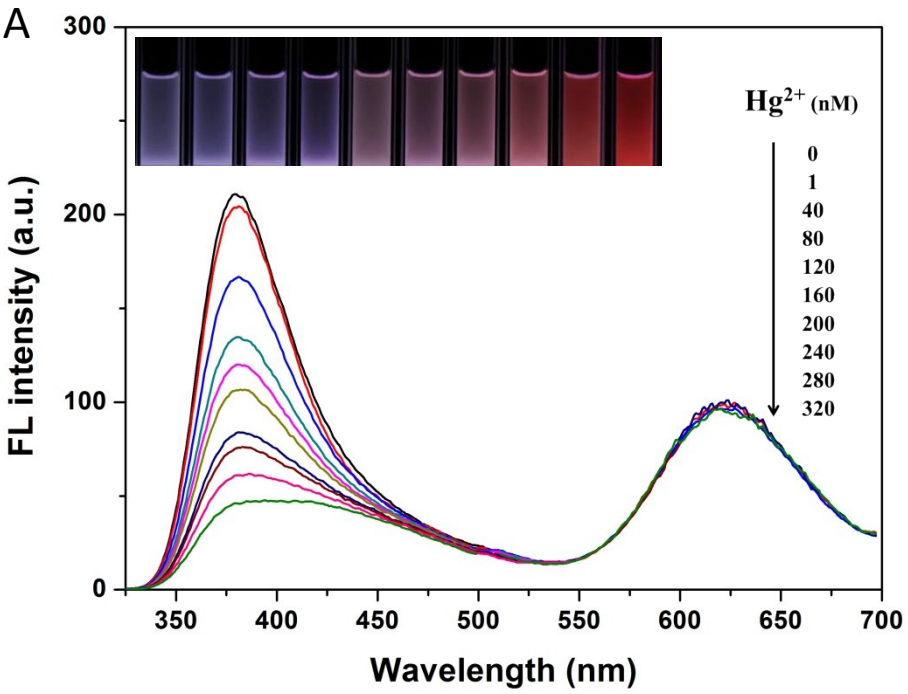
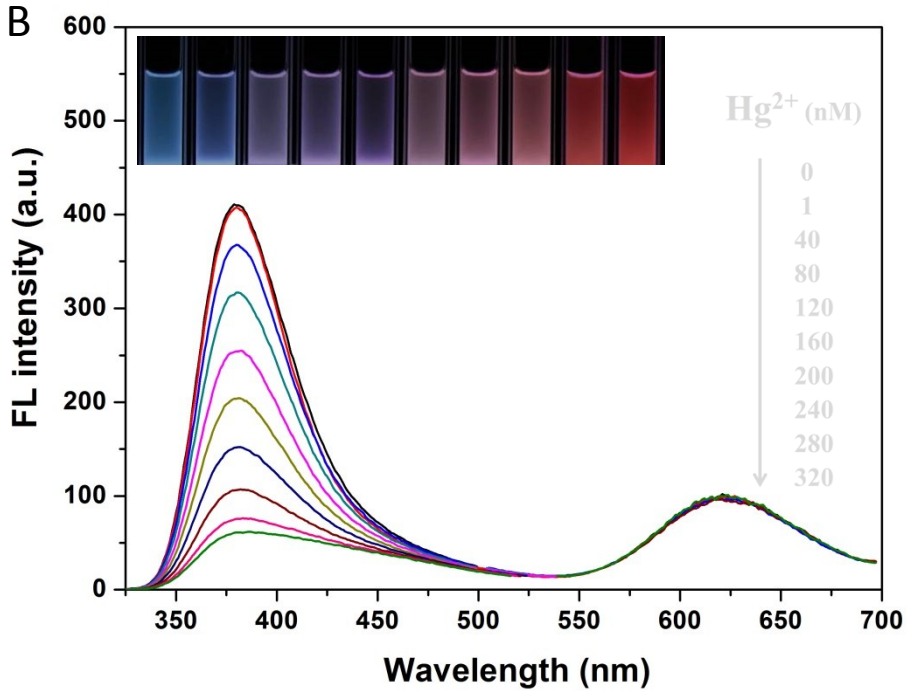


Figure S12. XPS spectra of B-CDs (bottom) and B-CDs-Hg complex.


A
FL intensity (a.u.)
Wavelength (nm)
Hg2+ (nM)
0
1
40
80
120
160
200
240
280
320


B
FL intensity (a.u.)
Wavelength (nm)
Hg2+ (nM)
0
1
40
80
120
160
200
240
280
320

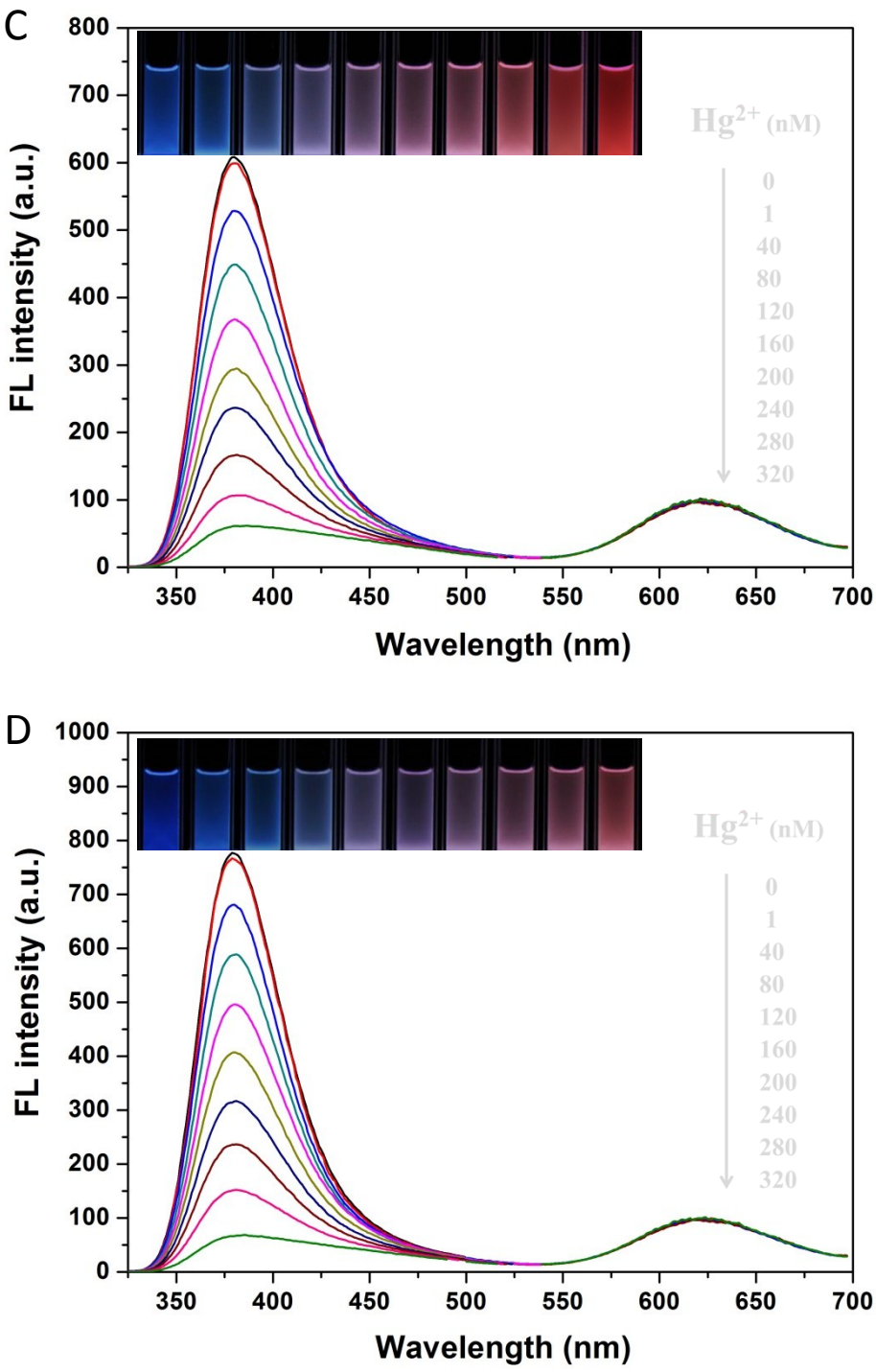


Figure S13. The fluorescent spectra of the mixing B-CDs/R-CDs with the addition of Hg^{2+}. Before measurements, the fluorescent intensity ratios in the mixing B-CDs/R-CDs were adjusted to (A) 2:1, (B) 4:1, (C) 6:1, and (D) 8:1. The insets show the corresponding fluorescent photos under a 254 nm UV lamp.

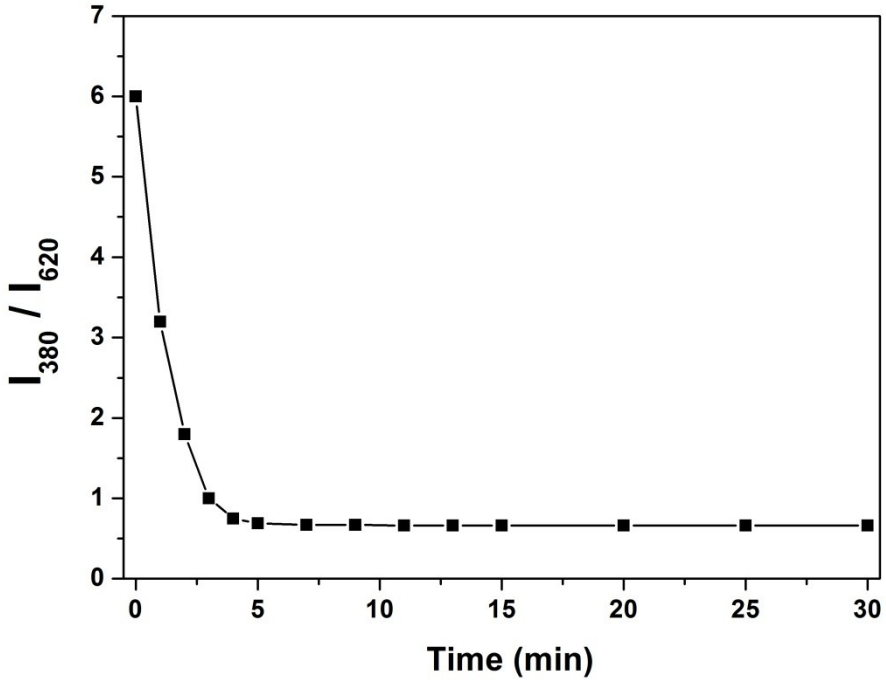


Figure S14. The temporal fluorescent response by the ratiomertric fluorescence I_{380}/I_{620} after the addition of 320 nM Hg^{2+}.

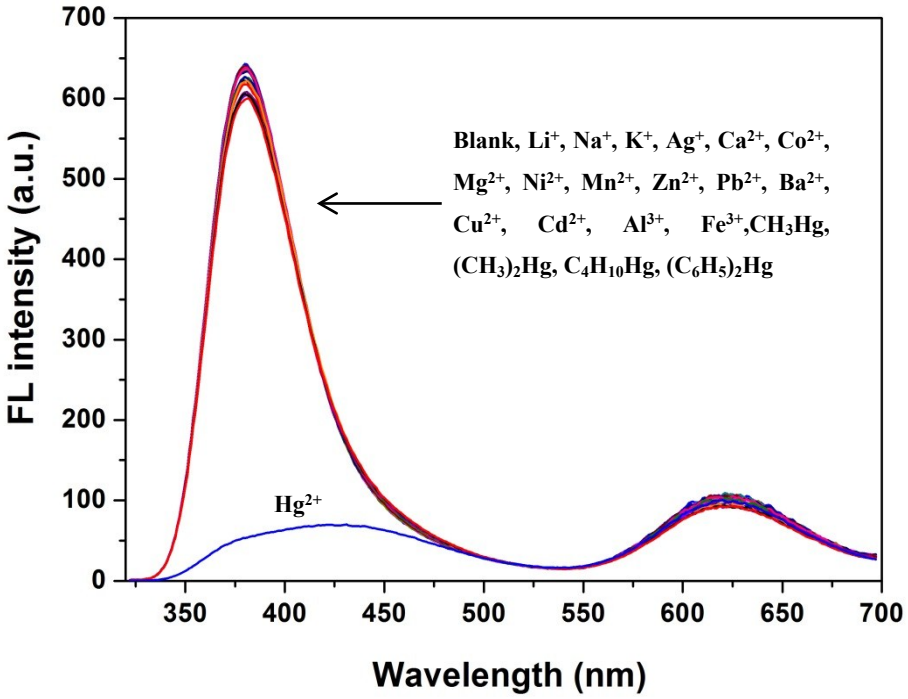


Figure S15. The ratiometric fluorescent responses to various metallic ions with Hg^{2+}. The selectivity tests were done in HEPES buffer (pH=7.4) with the addition of 1 μM various metallic ions and organic mercury into the mixing B-CDs/R-CDs (6:1 in fluorescent intensity).

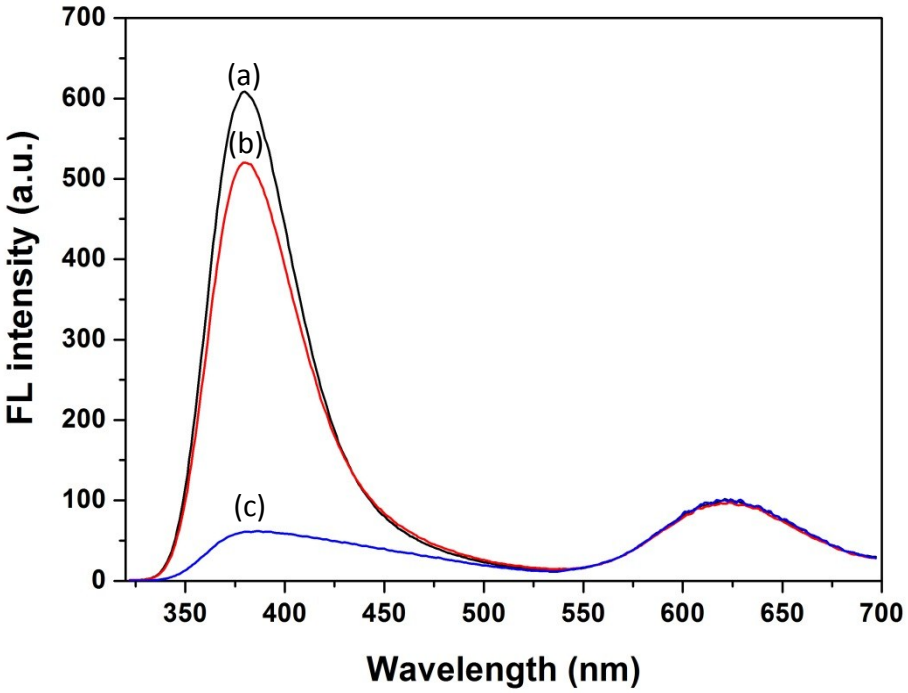


Figure S16. The fluorescent spectra of the ratiometric probe after and before the additions of metallic ions. (a) Without any addition of metallic ions. (b) The addition of 1 μM Li^{+}, Na^{+}, K^{+}, Ag^{+}, Ca^{2+}, Co^{2+}, Mg^{2+}, Ni^{2+}, Mn^{2+}, Zn^{2+}, Pb^{2+}, Ba^{2+}, Cu^{2+}, Cd^{2+}, Al^{3+}, Fe^{3+} together. (c) A subsequent addition of 320 nM Hg^{2+} in (b).

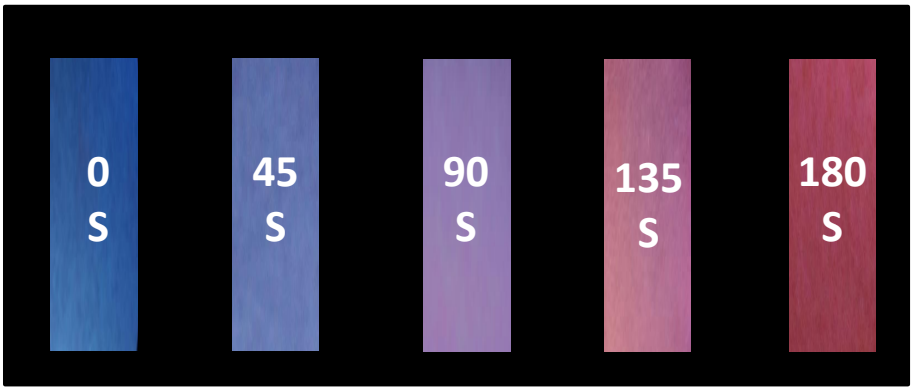


Figure S17. The temporal color changes of fluorescent test paper upon the addition of 320 nM Hg^{2+}. The photos were taken under a 254 nm UV lamp.