

Supporting Information of

Acid oxidation of muskmelon fruit for the fabrication of carbon dots with specific emission color for recognition of Hg^{2+} ion and cells imaging

Mittal L. Desai^a, Sanjay Jha^b, Hirakendu Basu^c, Rakesh Kumar Singhal^c, Tae-Jung Park^d and Suresh Kumar Kailasa^{a*}

^aDepartment of Applied Chemistry, S. V. National Institute of Technology, Surat-395 007, India

^bGujarat Agricultural Biotechnology Institute, Navsari Agricultural University, Surat-395007, India

^cAnalytical Chemistry Division, Bhabha Atomic Research Center, Trombay, Mumbai 400085, India

^dDepartment of Chemistry, Institute of Interdisciplinary Convergence Research, Research Institute of Halal Industrialization Technology, Chung-Ang University, 84 Heukseok-ro, Dongjak-gu, Seoul, 06974, Republic of Korea

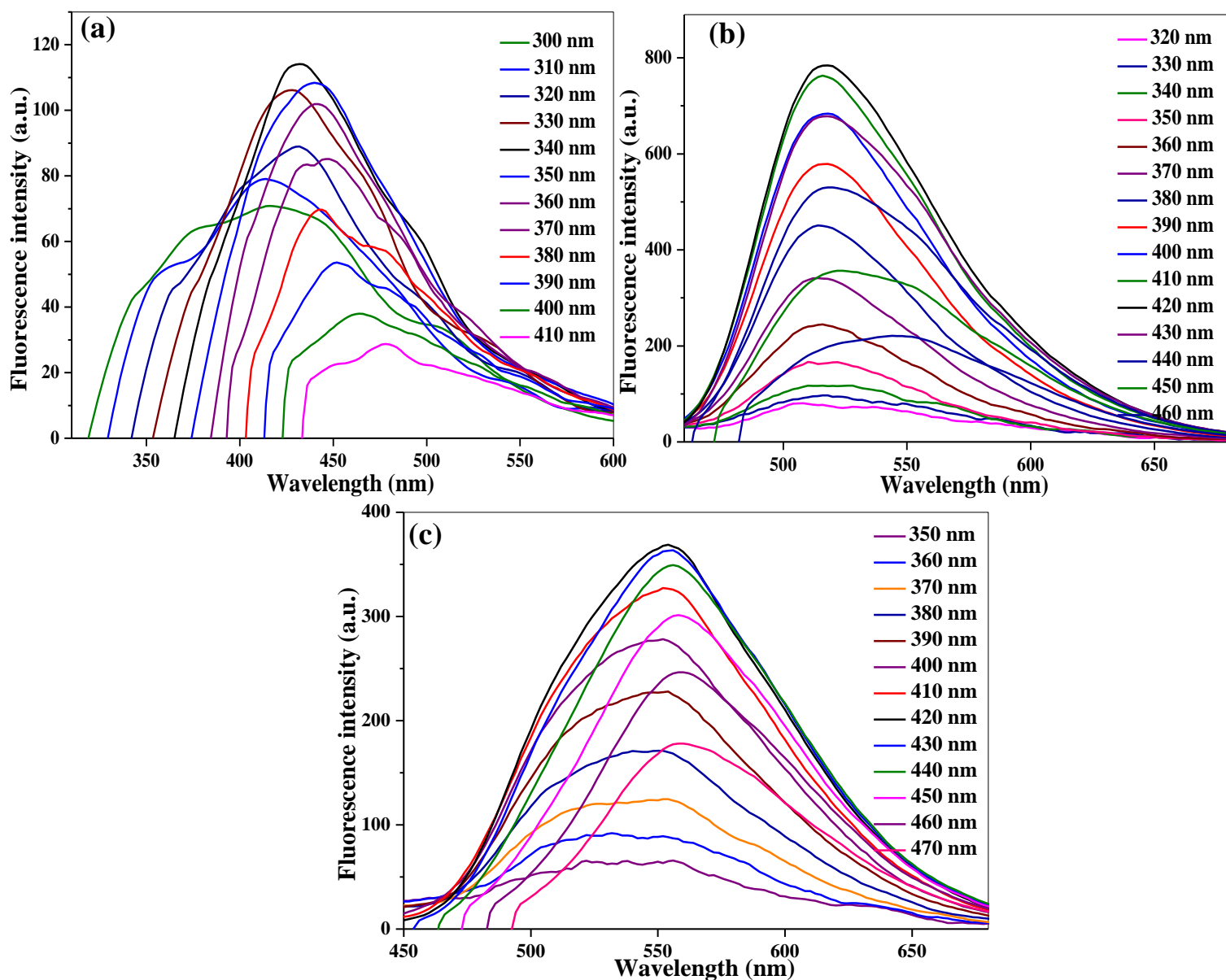


Figure S1. Emission spectra of (a) B- (b) G- and (c) Y- CMCDs at different excitation wavelengths.

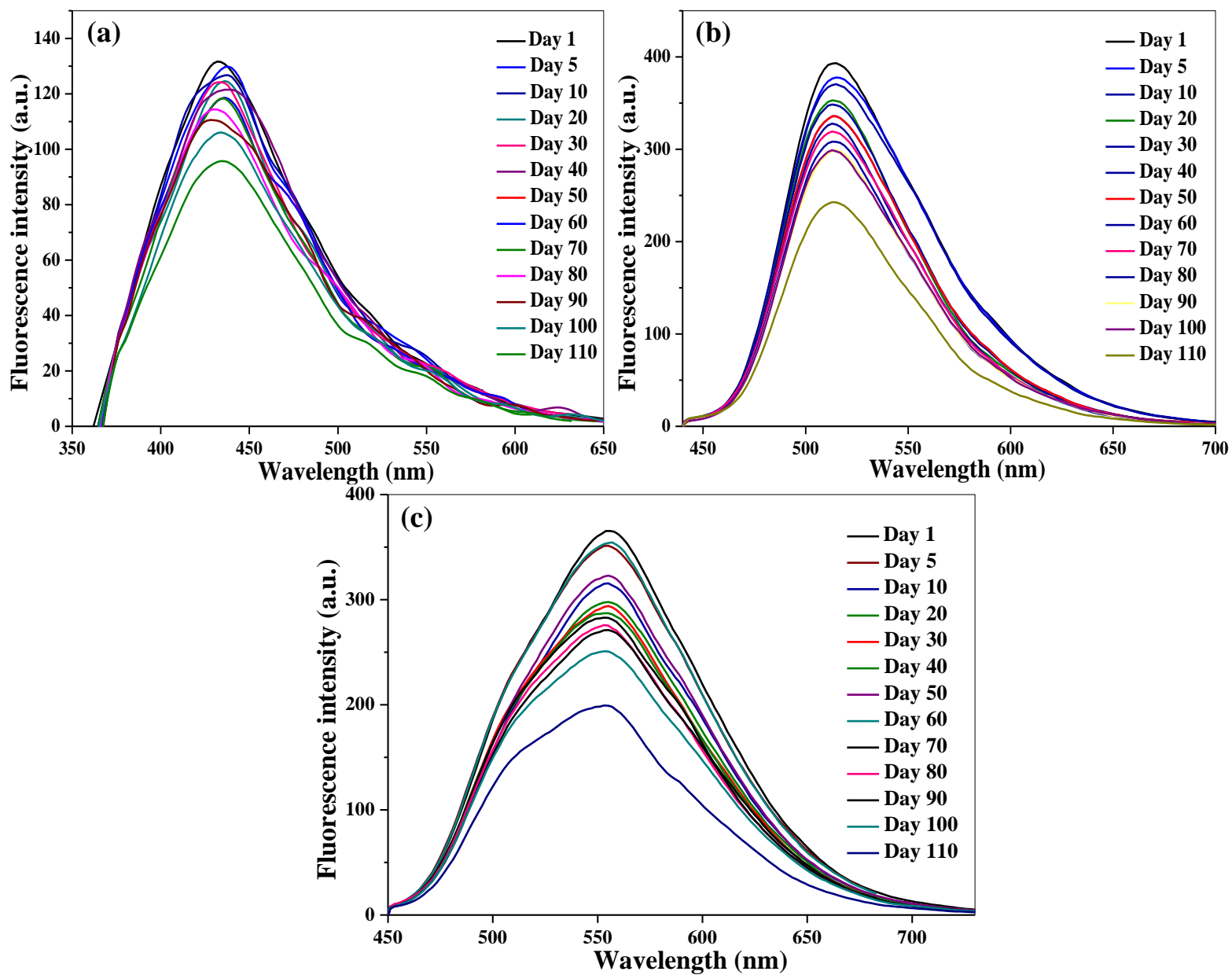


Figure S2. Fluorescence emission spectra of (a) B- (b) G- and (c) Y- CMCDs measured from 1 to 110 days.

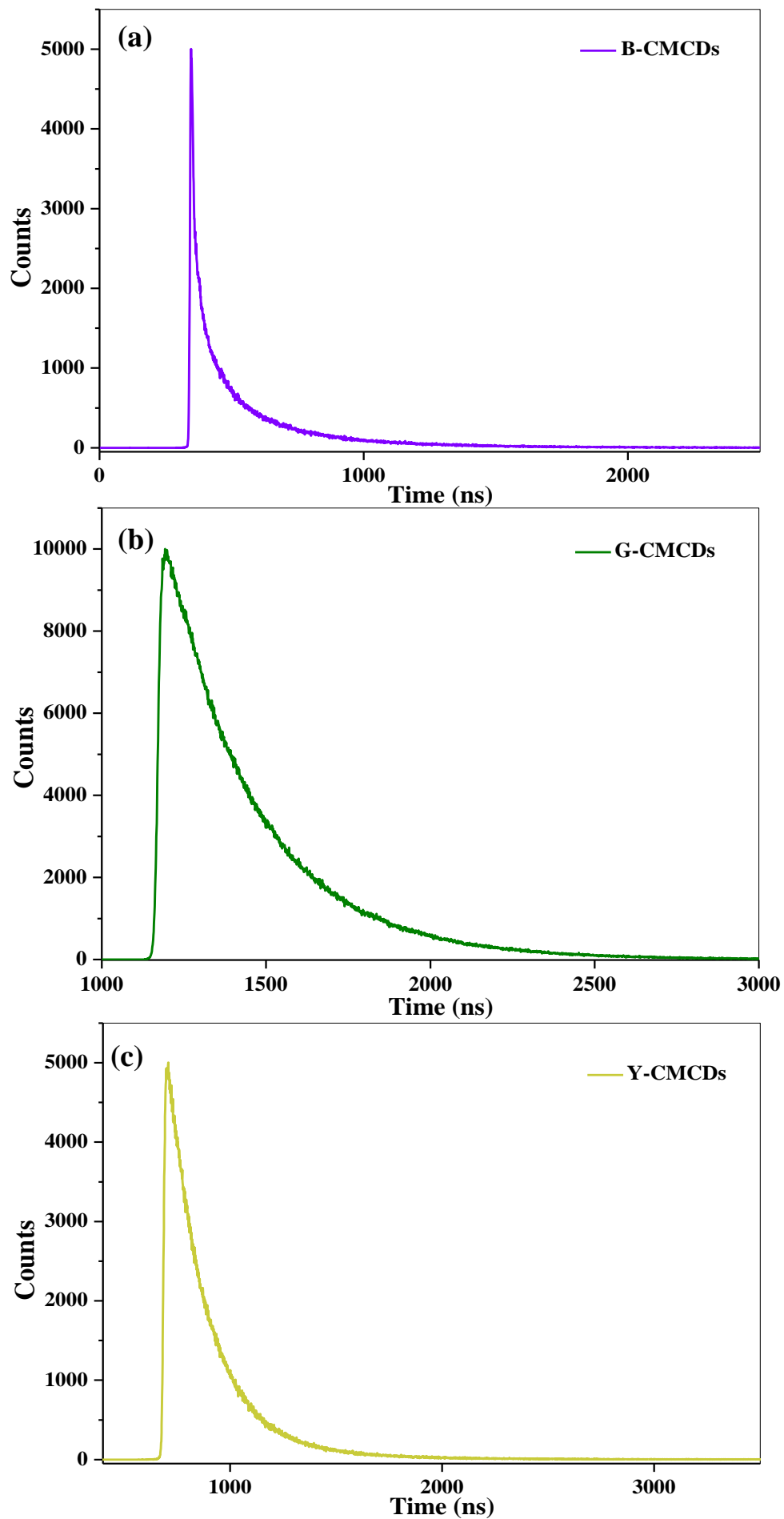


Figure S3. Fluorescence life time measurement of (a) B- (b) G- and (c) Y –CMCDs.

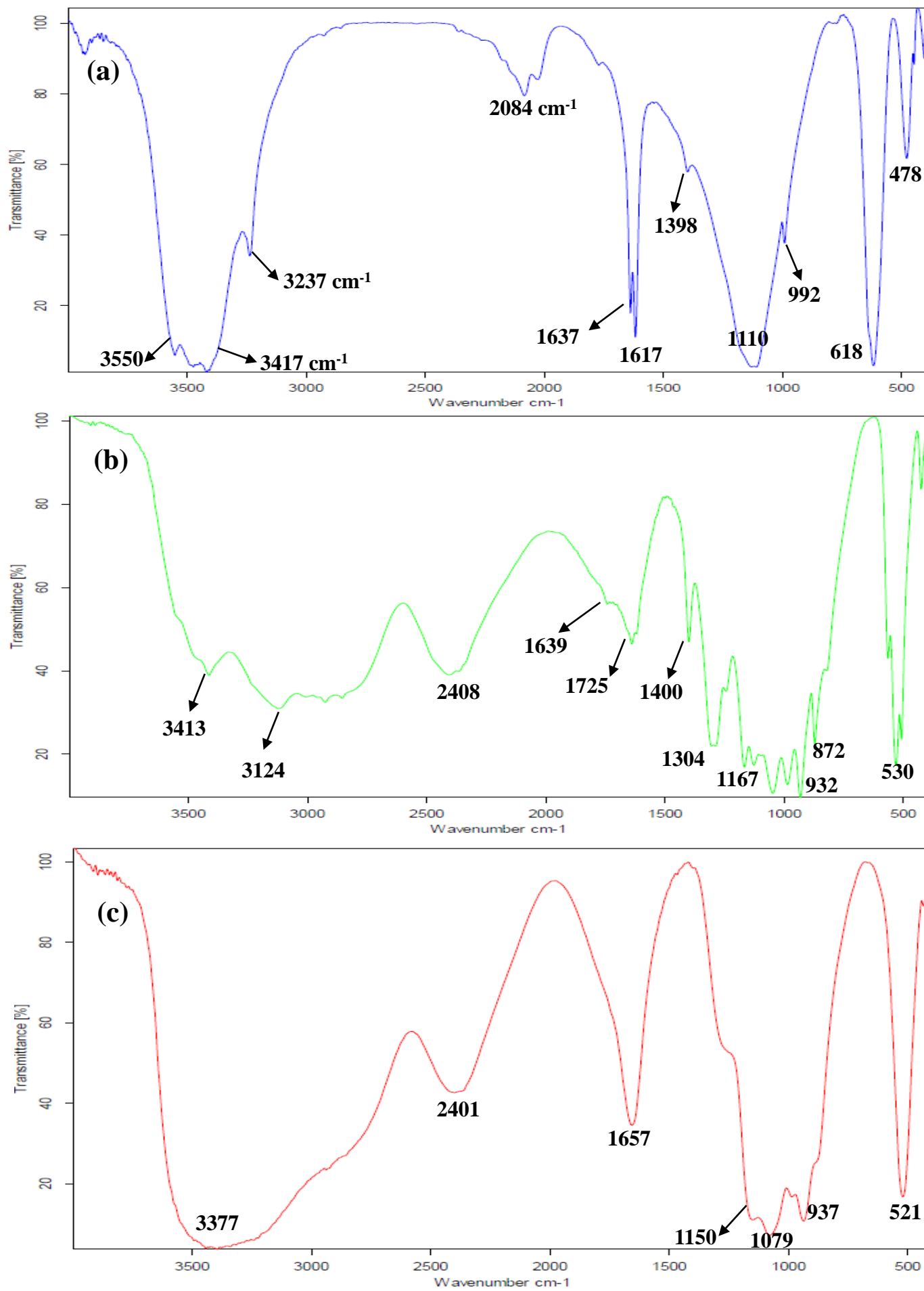


Figure S4. FT-IR spectra of (a) B- (b) G - and (c) Y-CMCDs.

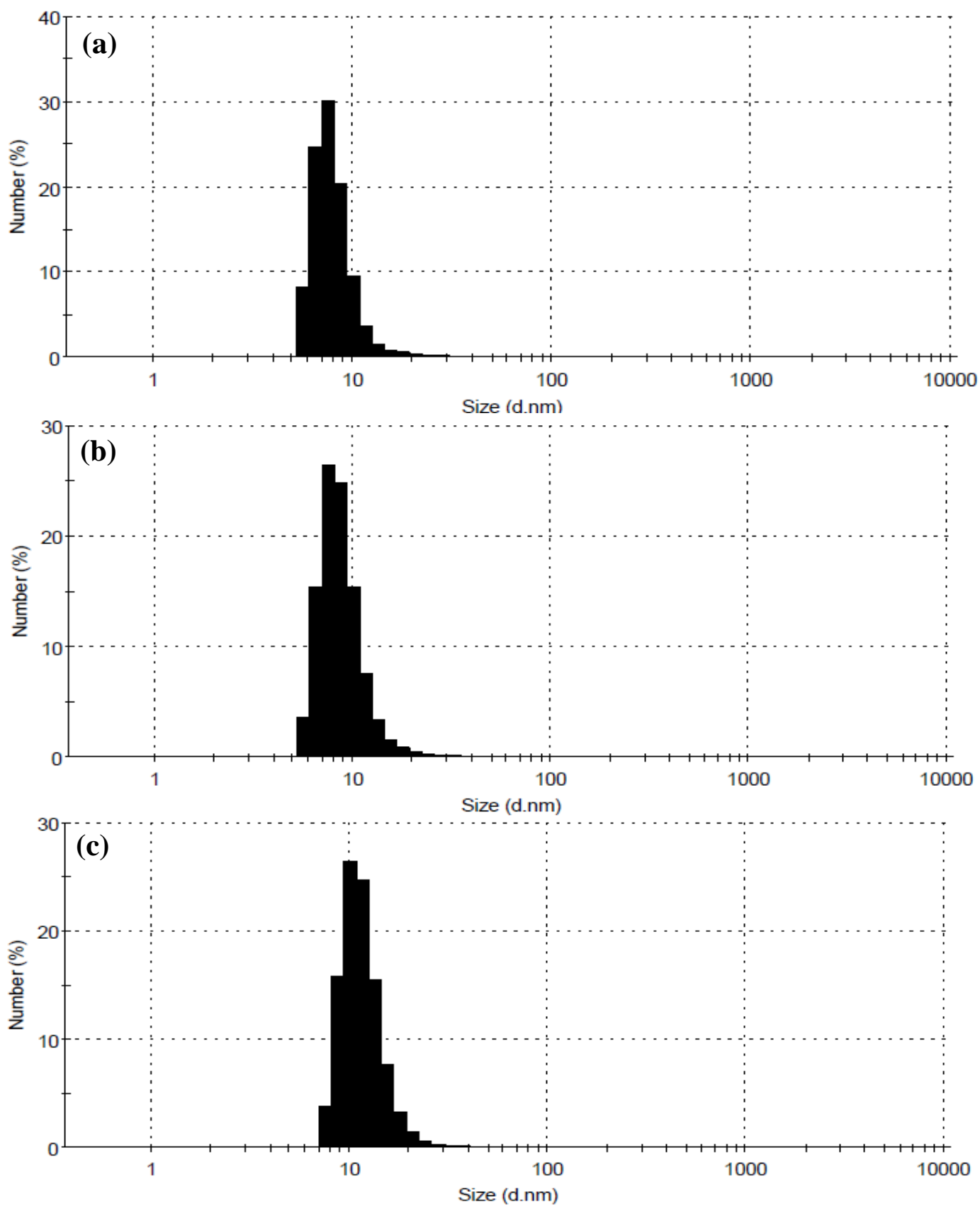


Figure S5. Dynamic light scattering measurement of (a) B- (b) G- and (c) Y -CMCDs.

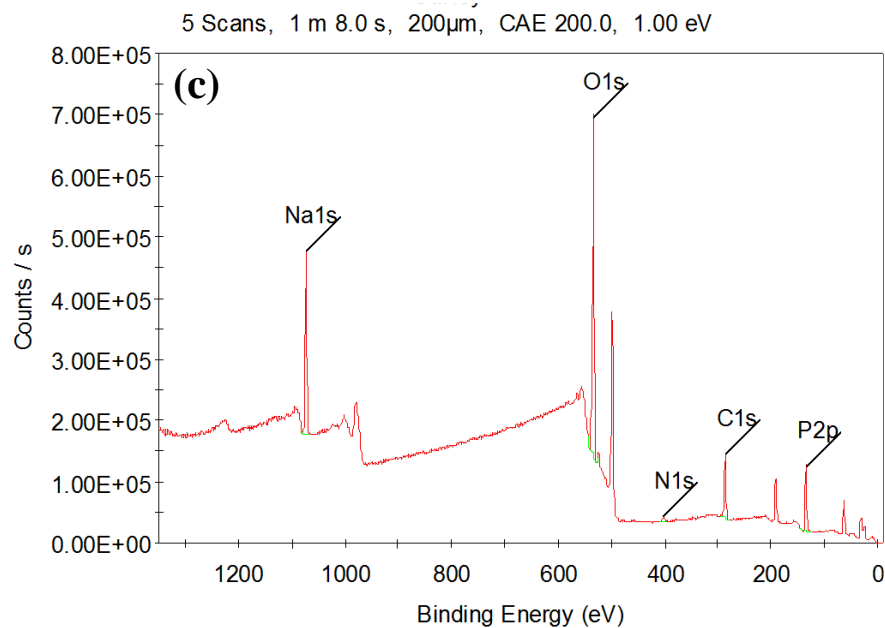
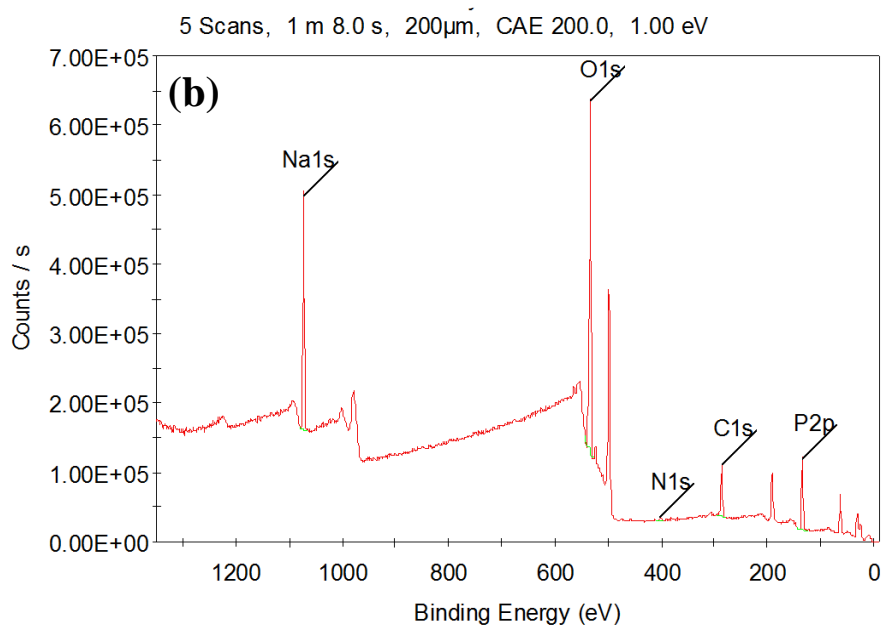
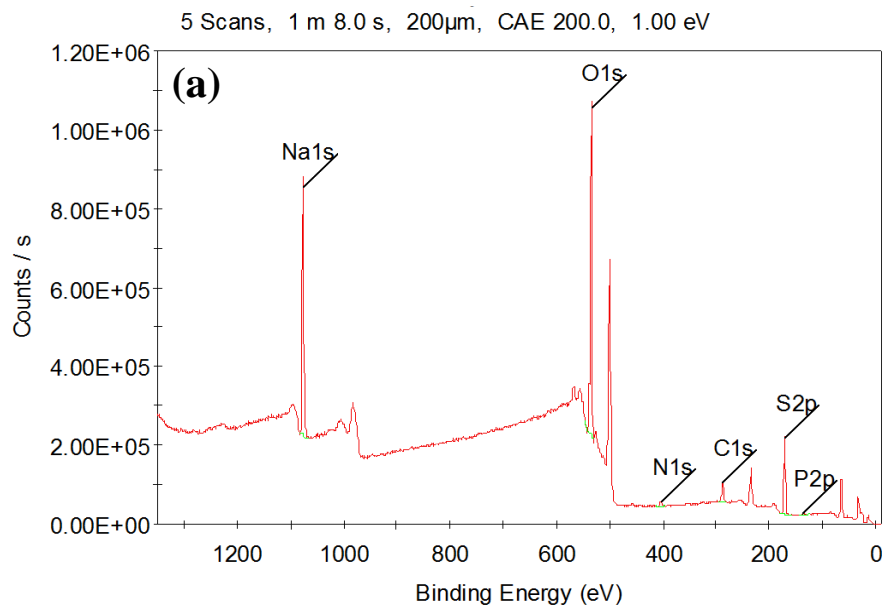


Figure S6. XPS survey of (a) B- (b) G- and (c) Y -CMCDs.

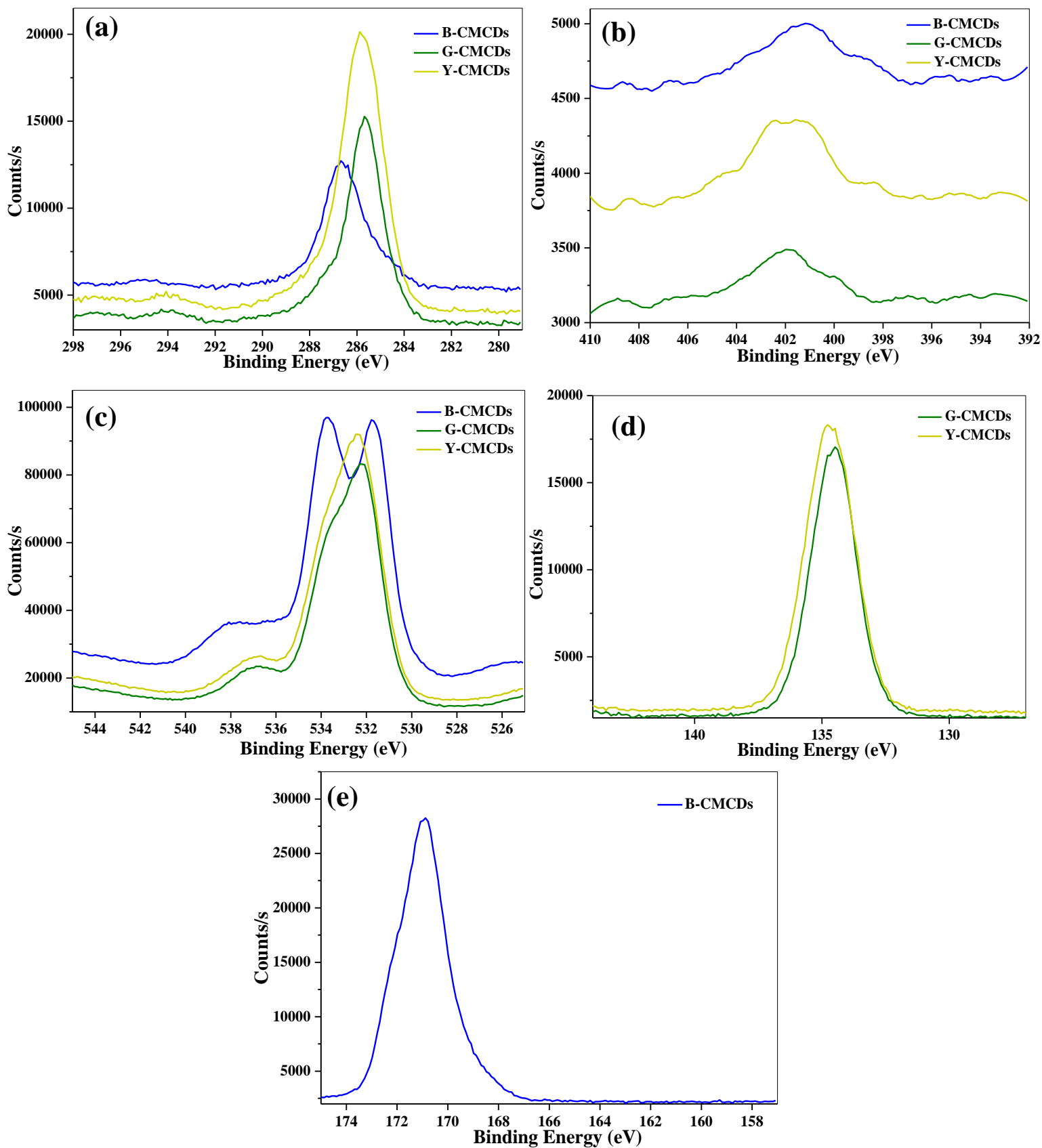


Figure S7. High resolution XPS data of (a) C 1s (b) N 1s (c) O 1s for three CMCDs, (d) P 2p XPS peaks for G- and Y- CMCDs and (e) S 2p XPS for B - CMCDs.

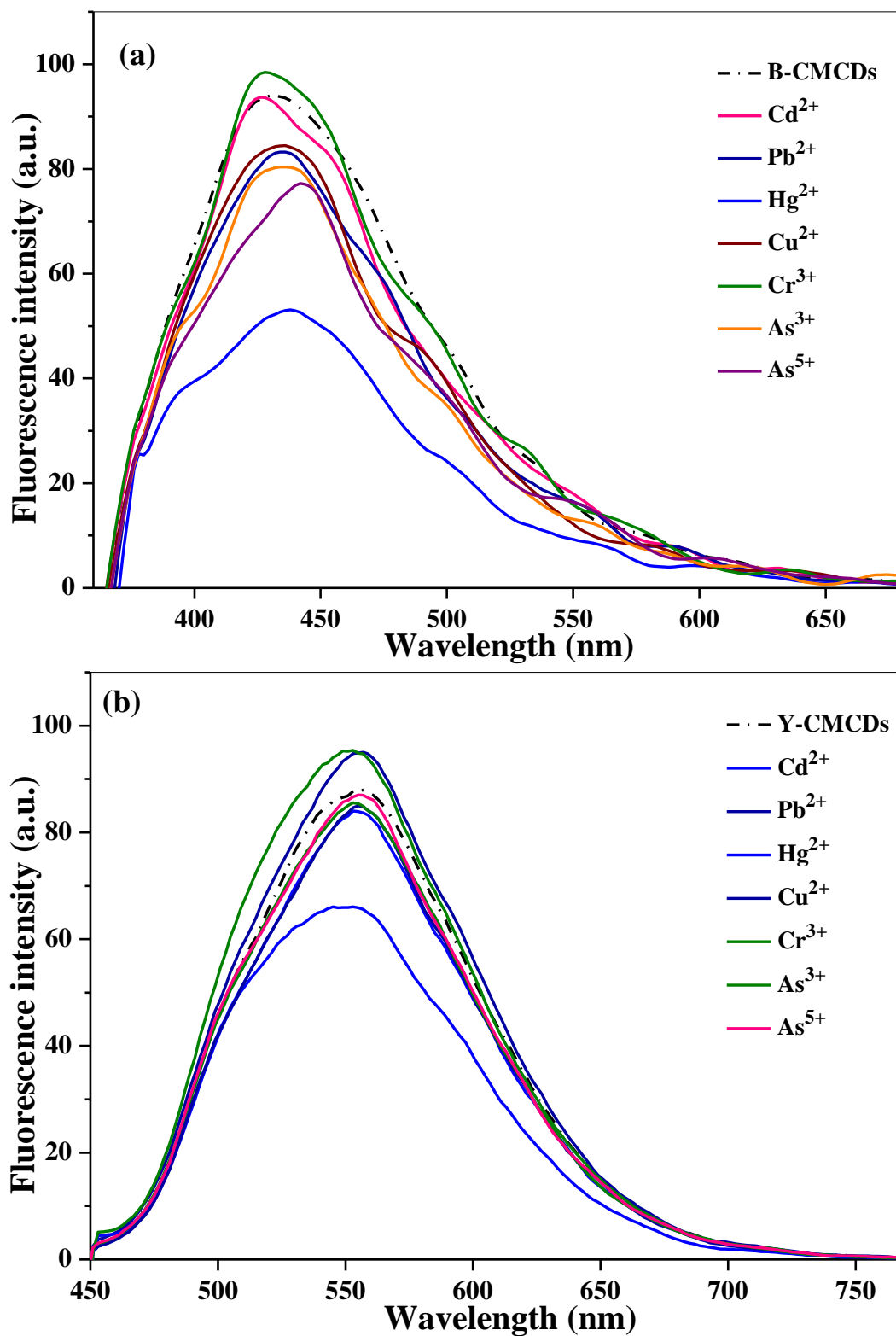


Figure S8. The behaviour of different metal ions (Cd²⁺, Pb²⁺, Hg²⁺, Cu²⁺, Cr³⁺, As³⁺ and As⁵⁺, 500 μ M) on (a) B-and (b) Y - CMCDs (shown with dotted black line).

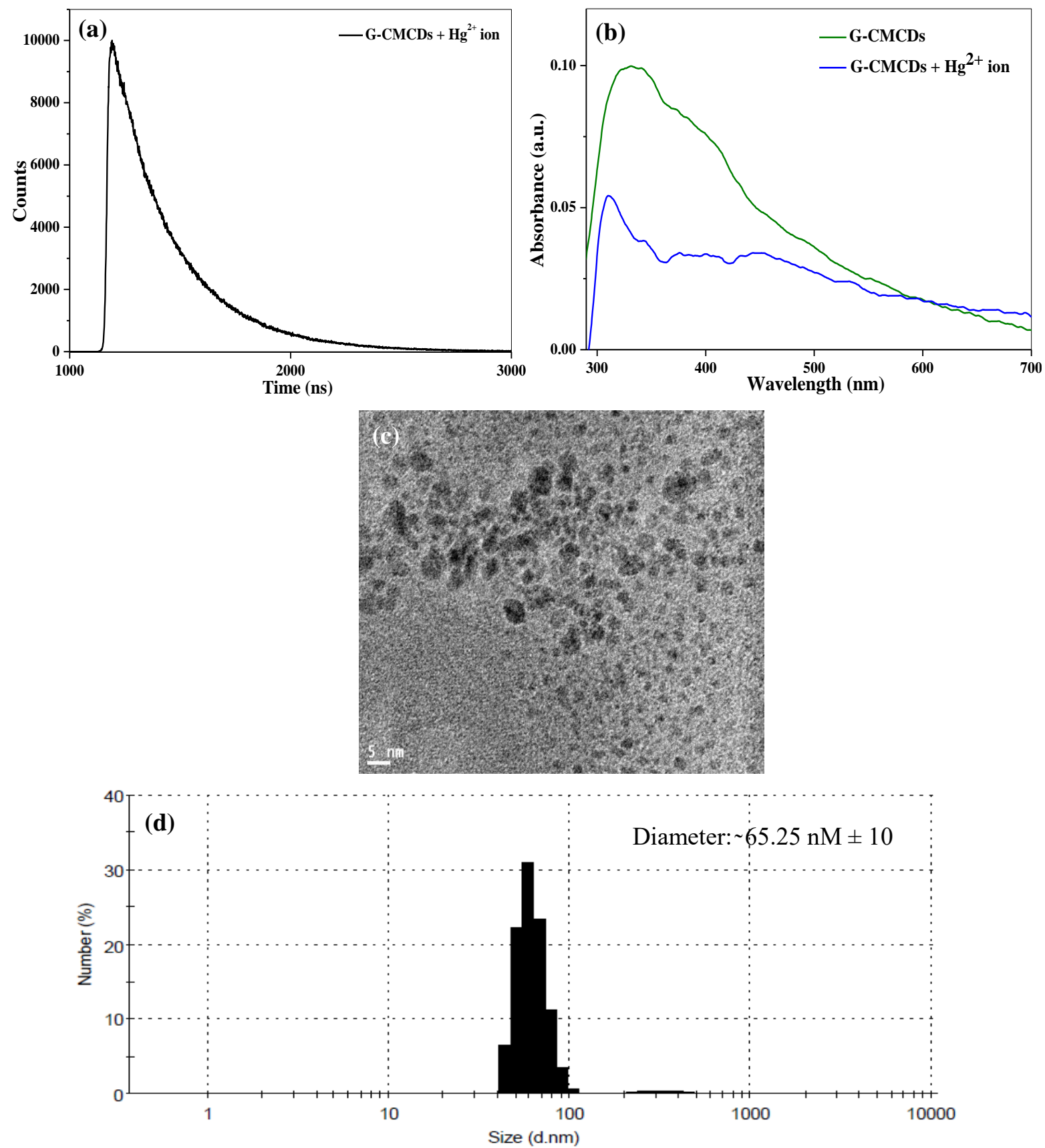


Figure S9. (a) Fluorescence life time (b) UV-visible absorption (c) high resolution transmission electron microscopy and (d) DLS data of G-CMCDs with Hg²⁺.

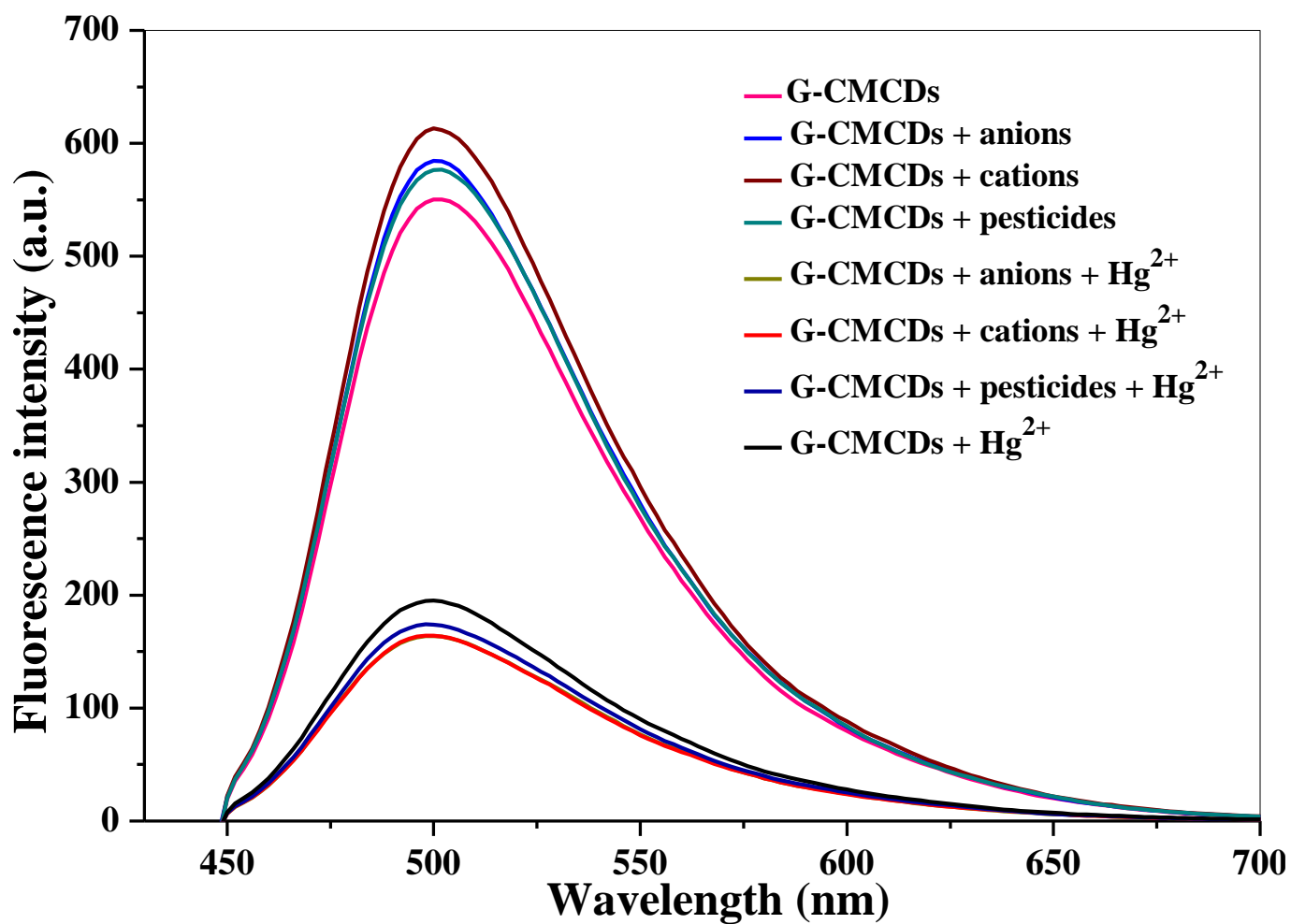


Figure S10. Emission spectra of G –CMCDs in the presence of mixture of anions (Cl^- , S^{2-} , CH_3COO^- , PO_4^{3-} , NO_3^- and $\text{Cr}_2\text{O}_7^{2-}$), cations (Cu^{2+} , Co^{2+} , Ni^{2+} , As^{3+} and Cr^{3+}) and pesticides (thiram, chlopropham, quinalphos, monocrotophos and triazophos), respectively, 500 μM .

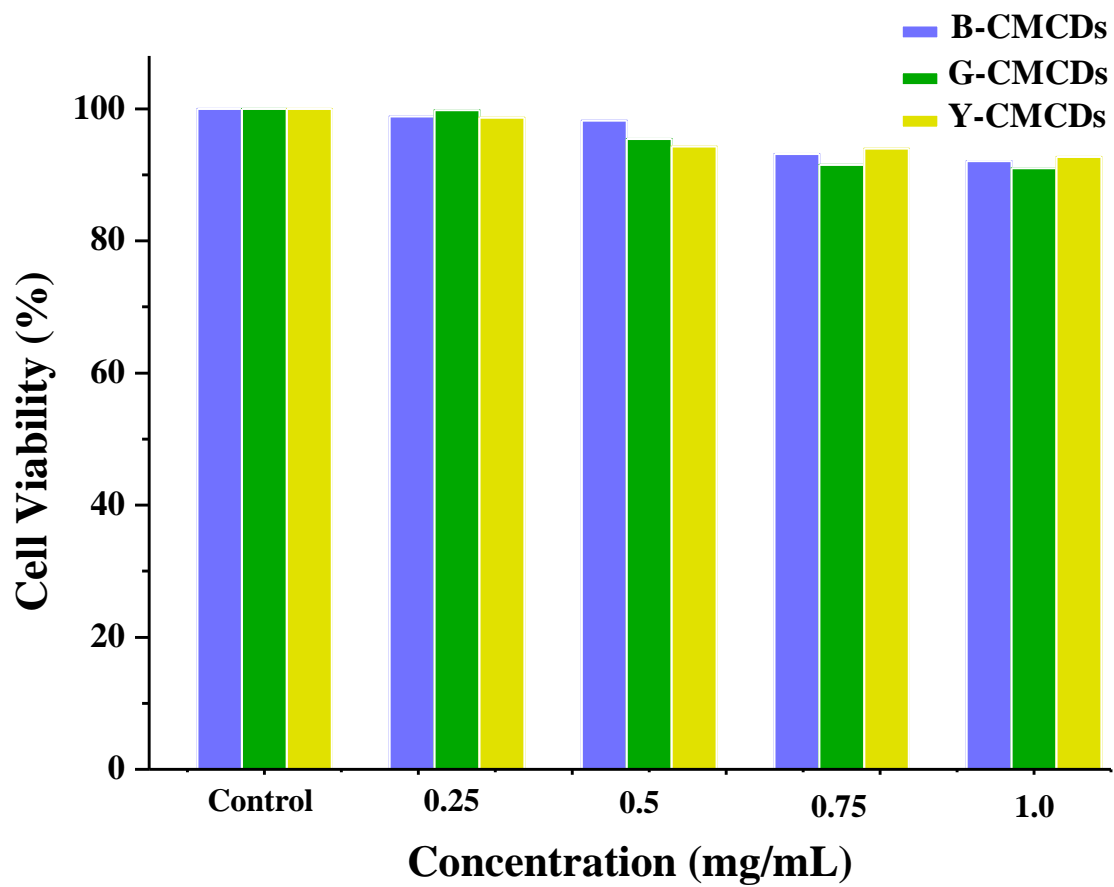


Figure S11. Cytotoxicity of B -, G- and Y -CMCDs in the concentration range of (0, 0.25, 0.5, 0.75 and 1.0 mg/mL) on NRK cells.

Table S1. Analysis of Hg²⁺ ion in spiked canal water and blood serum sample by using G – CMCDs as a probe.

Sample	Added conc. (μM)	Found Conc. (μM)	Recovery (%) (n=3)	RSD (%) (n=3)
Canal water	2.5	2.49	99.49	1.11
	5.0	5.04	100.89	0.25
	7.5	7.48	100.55	1.07
Blood serum sample	2.5	2.43	96.88	0.50
	5.0	4.81	96.97	1.04
	7.5	7.46	100.89	0.13