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Supporting Information

2 Sustainable Synthesis of Carbon Dots from Ananas Comosus as Renewable Biomass: A 3 Nanomolar Level Detection of Glutathione

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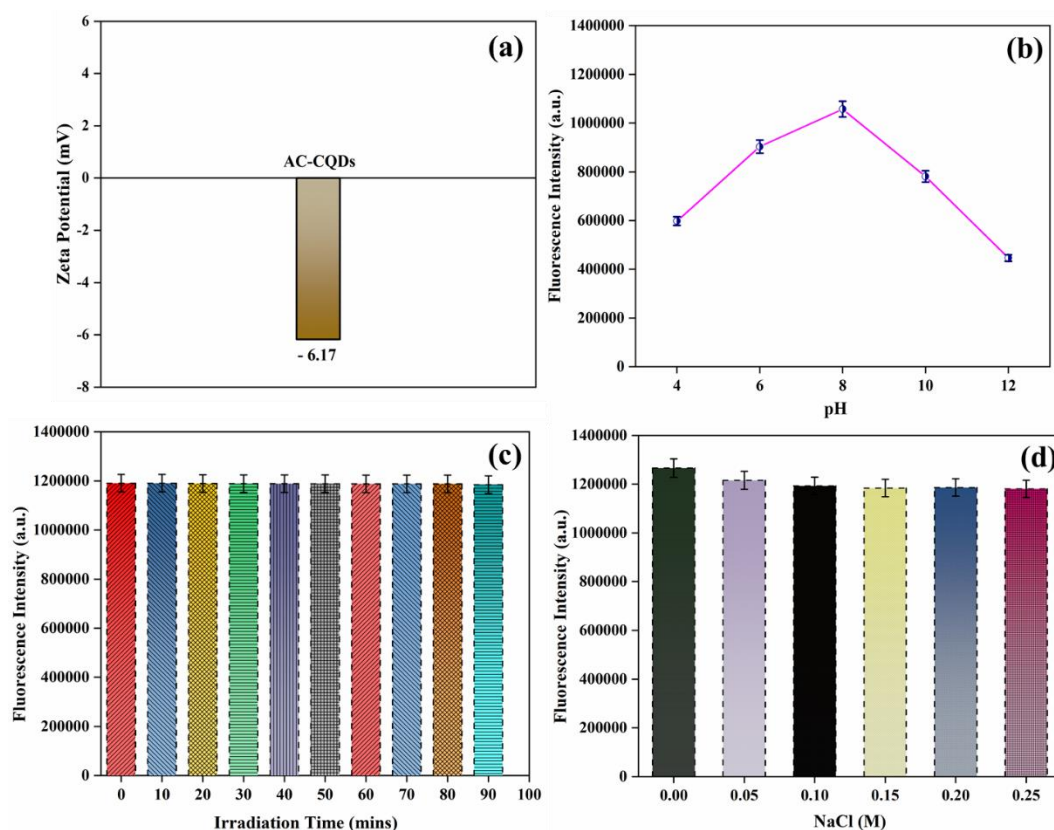
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Patiala 147004, India

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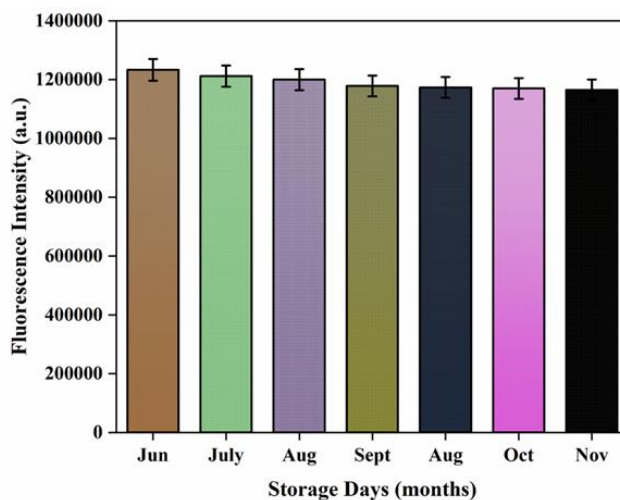
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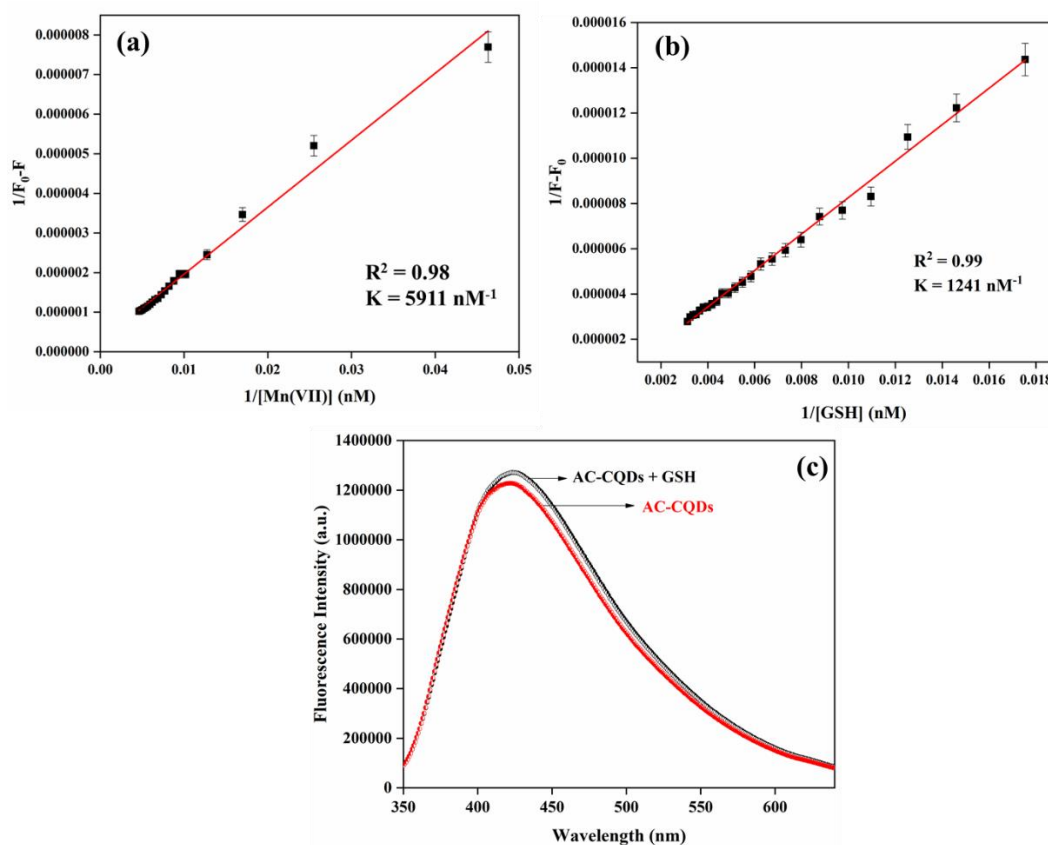
12 **Figure S1.** (a) Zeta potential of AC-CQDs, (b) emission spectra at different pH (4-12), (c)
13 stability study of AC-CQDs with irradiation time, and (d) impact of ionic strength on PL
14 intensity of AC-CQDs with different concentrations of NaCl.



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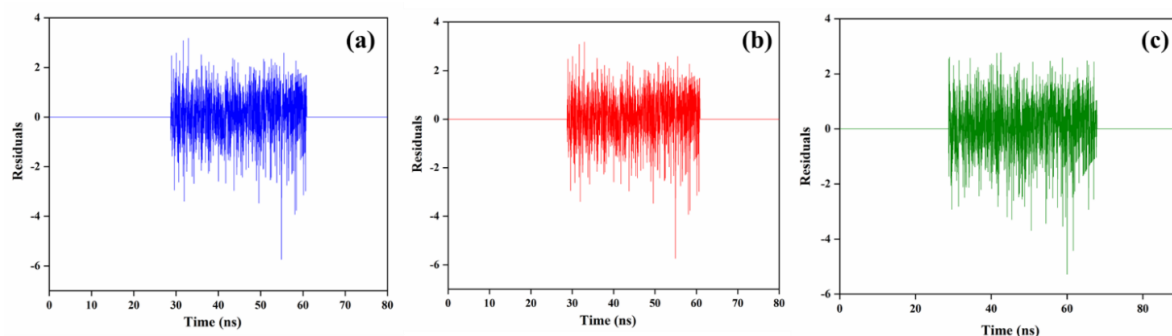
16 **Figure S2.** Effect of storage duration on stability of AC-CQDs

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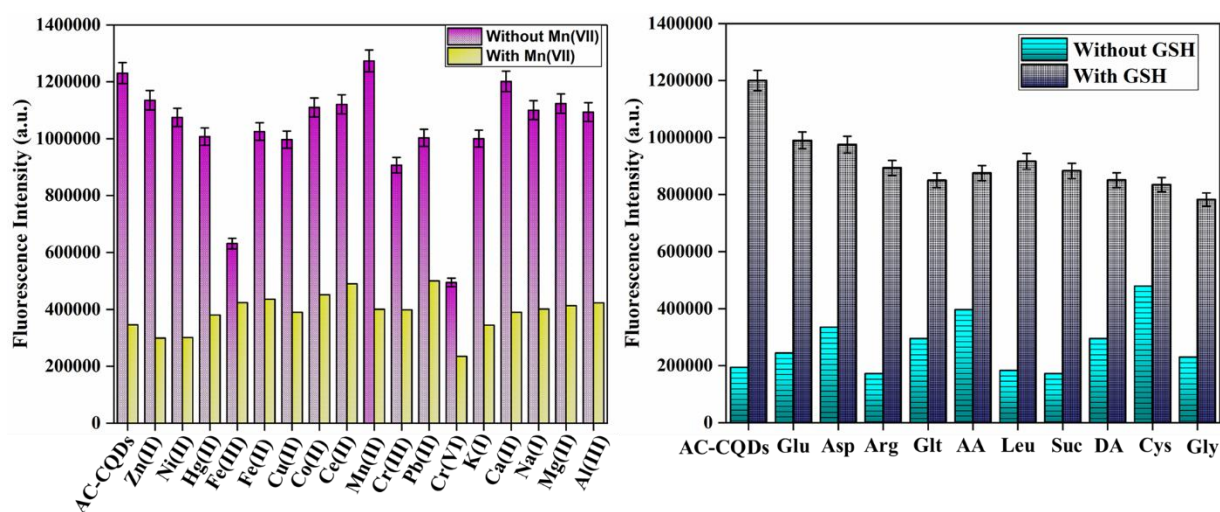


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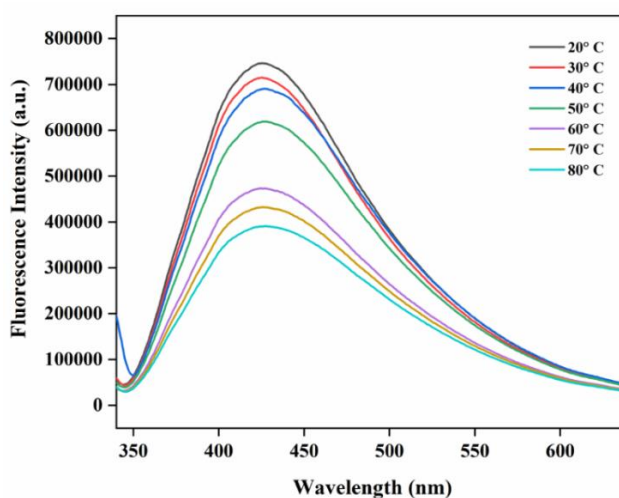
19 **Figure S3.** B-H binding plot of (a) AC-CQDs with Mn (VII), (b) [AC-CQDs + Mn (VII)] in
 20 presence of GSH and (c) control experiment of PL intensity of AC-CQDs and GSH.



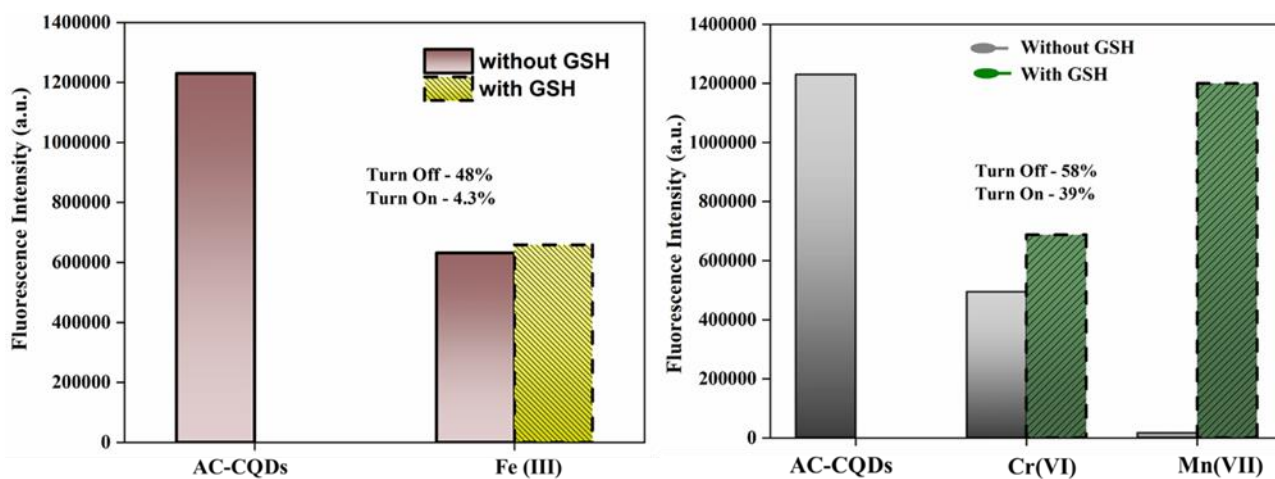
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22 **Figure S4.** Time-resolved emission spectral residual plots of (a) AC-CQDs, (b) [AC-CQDs +
23 Mn (VII)] and (c) [AC-CQDs + Mn (VII)] +GSH.



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25 **Figure S5.** (a) Interference study of AC-CQDs for Mn (VII) in presence of different metal
26 ions, (b) Interference study of [AC-CQDs + Mn (VII)] for GSH in presence of different
27 amino acids and biomolecules.

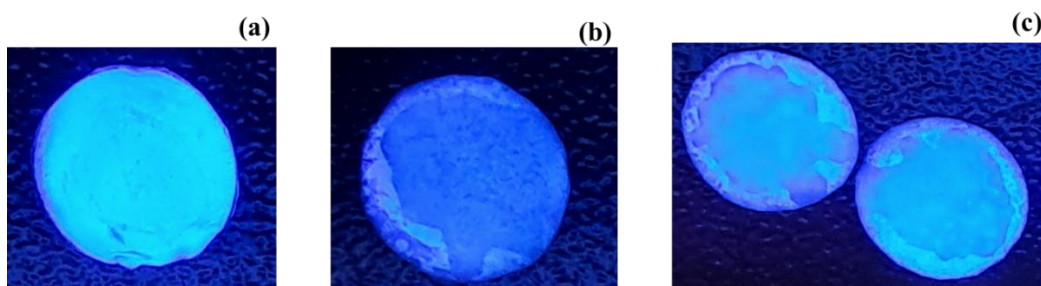


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29 **Figure S6.** Effect of Temperature on AC-CQDs.



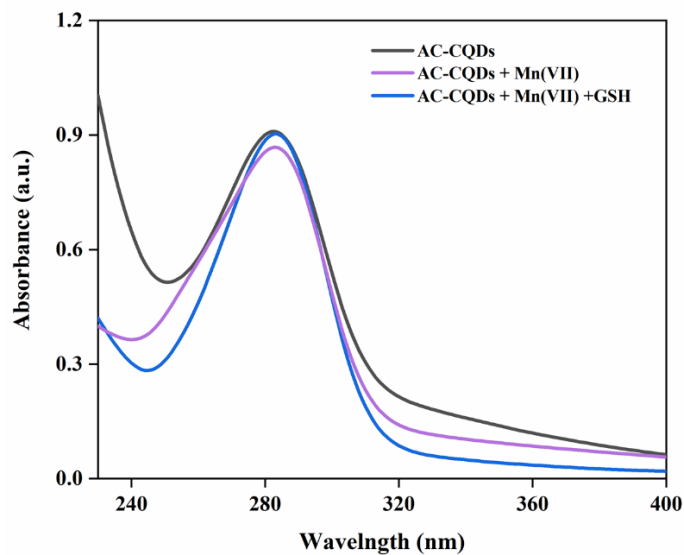
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31 **Figure S7.** Turn-On response of Fe (III) and Cr (VI) ions towards GSH.



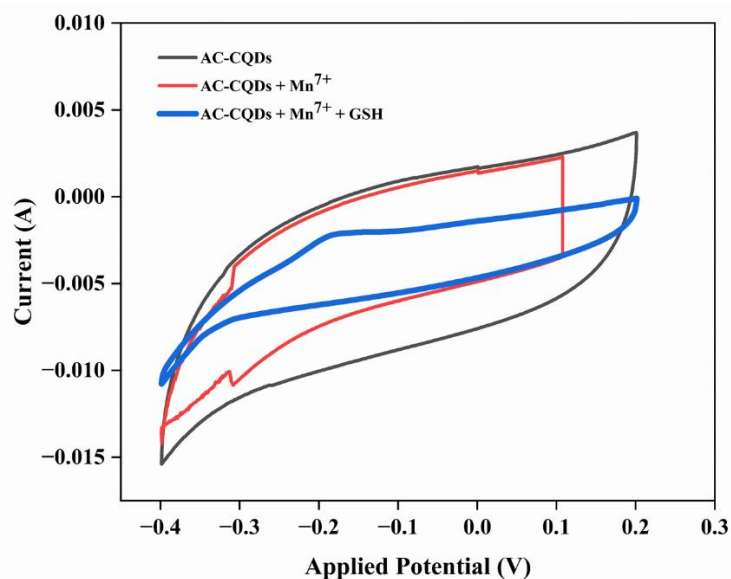
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33 **Figure S8.** Visual depiction of Fluorescence of (a) AC-CQDs, (b) [AC-CQDs + Mn (VII)]
 34 and (c) [AC-CQDs + Mn (VII)] + GSH.



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36 **Figure S9.** UV absorption of AC-CQDs, [AC-CQDs + Mn (VII)] and [AC-CQDs + Mn
 37 (VII)] + GSH



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39 **Figure S10.** Cyclic voltammogram of AC-CQDs, AC-CQDs@Mn⁷⁺ and AC-
40 CQDs@Mn⁷⁺]GSH

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42 **Table S1.** Time-resolved emission lifetime parameters of AC-CQDs with Mn (VII) ions and
43 GSH.

System	τ_1 (ns)	τ_2 (ns)	τ_3 (ns)	a_1	a_2	a_3	τ_{avg}^* (ns)	χ^2	DW [#]
AC-CQDs	0.84	2.52	8.63	0.22	0.31	0.46	4.93	1.11	1.90
AC-CQDs + Mn (VII)	0.56	2.24	6.45	0.19	0.37	0.42	3.64	1.06	1.98
AC-CQDs + Mn (VII)+ GSH	0.66	2.25	7.96	0.17	0.37	0.45	4.53	1.08	1.90

44 τ_{avg}^* (ns) = $\tau_1 a_1 + \tau_2 a_2 + \tau_3 a_3$, Error: $\pm 5\%$, # D.W. = Durbin-Watson parameter

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50 **Table S2.** Intraday and Inter day precision data for estimating Mn (VII) and GSH by the
 51 developed sensor.

Analytes	Conc. taken (nM)	Intra Day ^a		Inter Day ^b	
		%RSD	% Error ^c	%RSD	% Error ^c
Mn (VII)	40	0.82	0.47	1.71	0.98
	80	0.19	0.56	0.98	0.56
	100	0.17	0.10	1.35	0.78
GSH	100	1.83	1.05	1.69	0.97
	150	0.99	0.57	1.87	1.07
	200	0.42	0.24	1.20	0.69

52 Each result is the average of three separate determinations.

53 ^aWithin a day

54 ^bThree consecutive days

55 ^c%Error = %RSD/ \sqrt{n}

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57 **Table S3.** Utility of the developed AC-CQDs probe for detection of Mn (VII) in real
 58 samples.

Sample	spiked Conc (μ M)	found Conc (μ M)	recovery (%) [♦]	RSD (%)
River Water	0.1	0.097	97	0.42
	0.2	0.191	95.5	0.70
	0.3	0.286	95.3	1.50
Tap Water	0.1	0.096	96	1.38
	0.2	0.188	94	1.35
	0.3	0.271	90.3	2.40

59 [♦] = (Found conc/ Spiked conc) x 100