Supporting Information (SI)

Multi-stimuli Responsive Carbazole based Low Molecular Weight Gelator: Nanomolar Sensing of Cyanide Ions and Electrochromic Switching in Real-time

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^{1}H NMR Spectrum

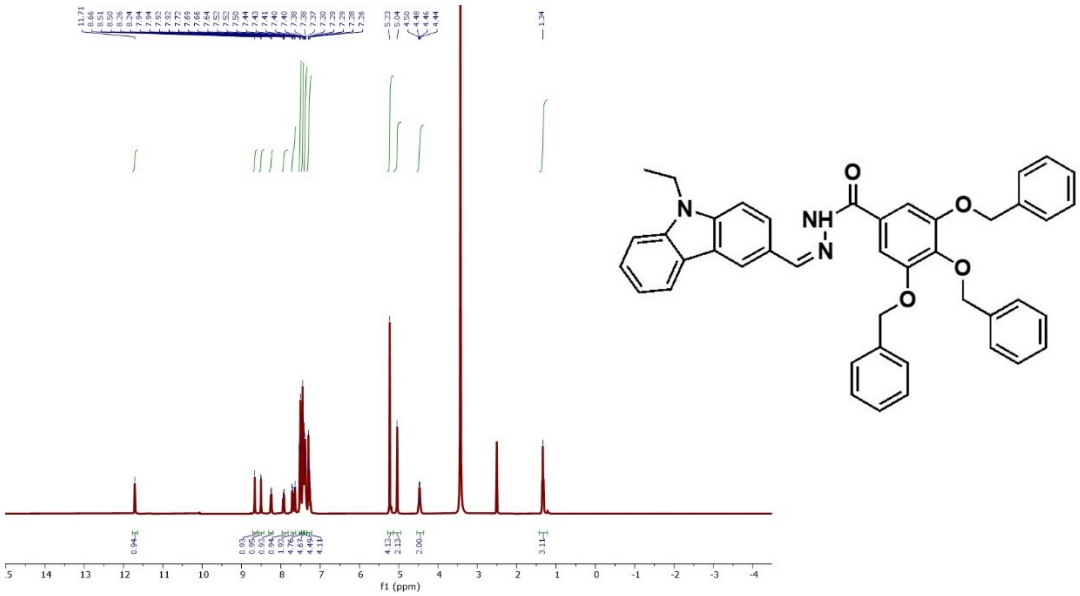


Figure SI-1. ^{1}H NMR spectrum of CBG in DMSO-d_6.

^{13}C NMR Spectrum

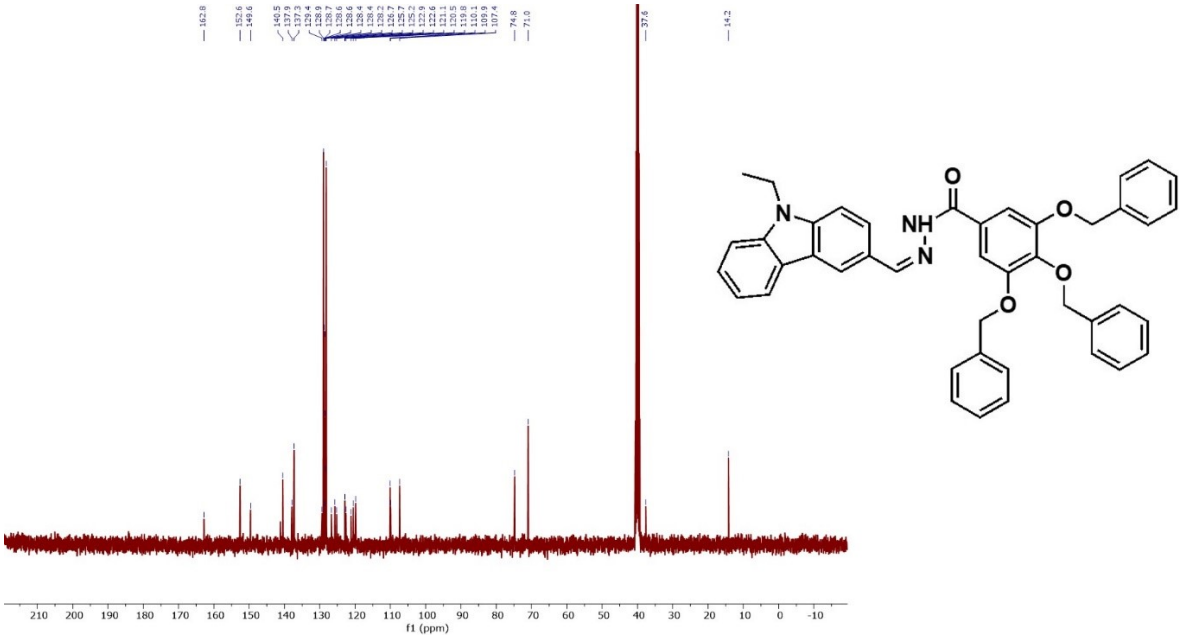
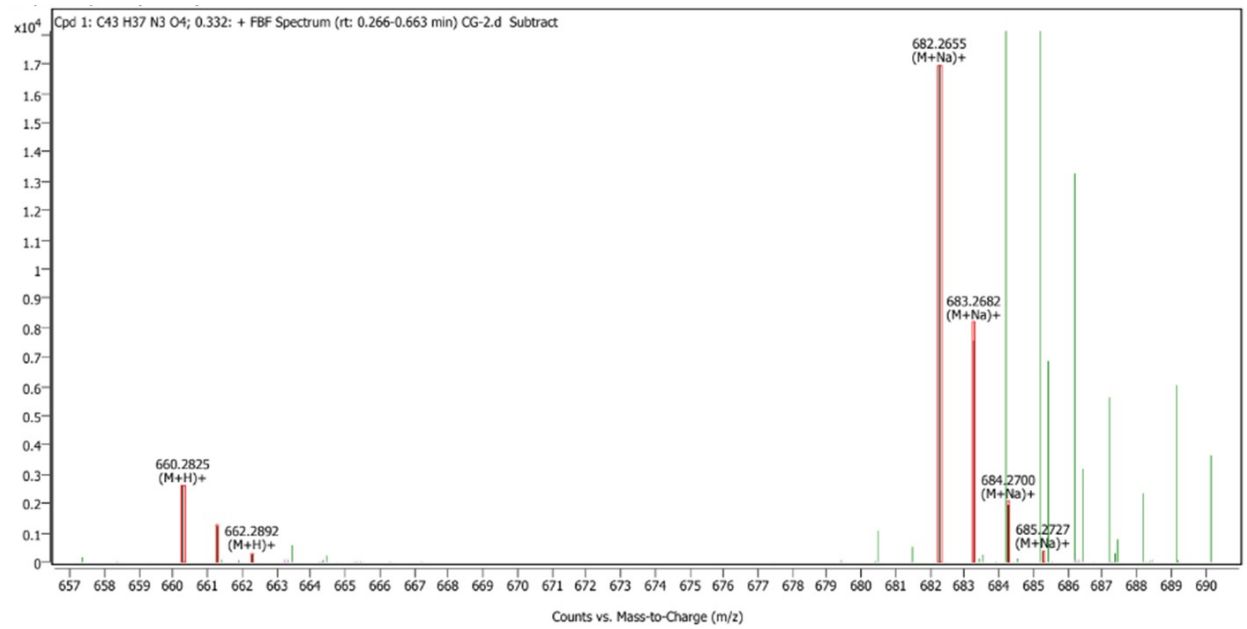


Figure SI-2. ^{13}C NMR spectrum of CBG in DMSO-d_6.

HRMS



Compound ID Table

Cpd	Formula	Mass (Tgt)	Calc. Mass	Mass	Species	Diff(Tgt.ppm)	mDa
1	C43 H37 N3 O4	659.2784	659.2759	660.2825 682.2655	(M+H)+ (M+Na)+	-3.86	-2.54

Figure SI-3. HRMS of CBG.

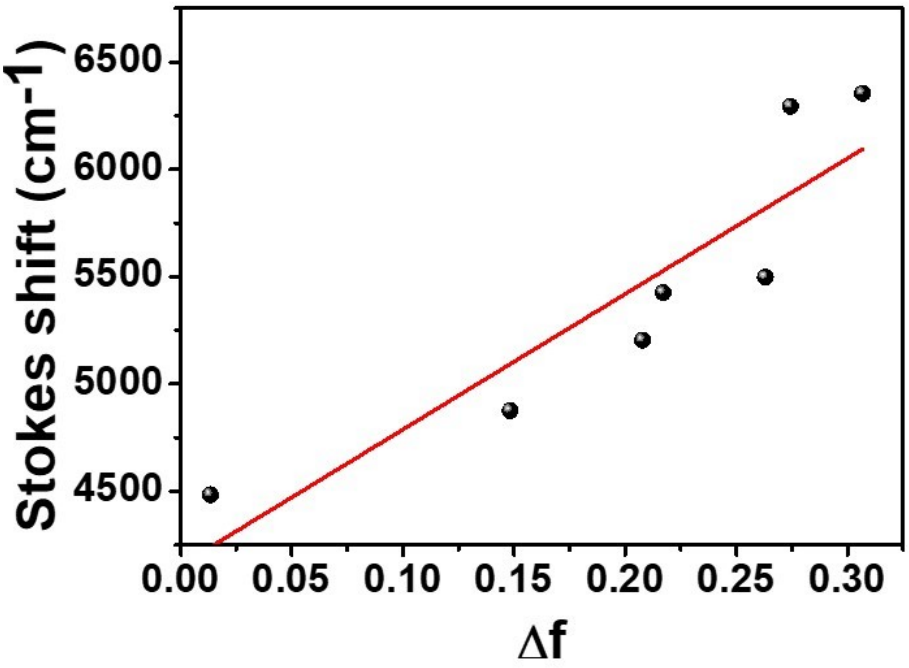


Figure SI-4. Lippert-Mataga plot of CBG.

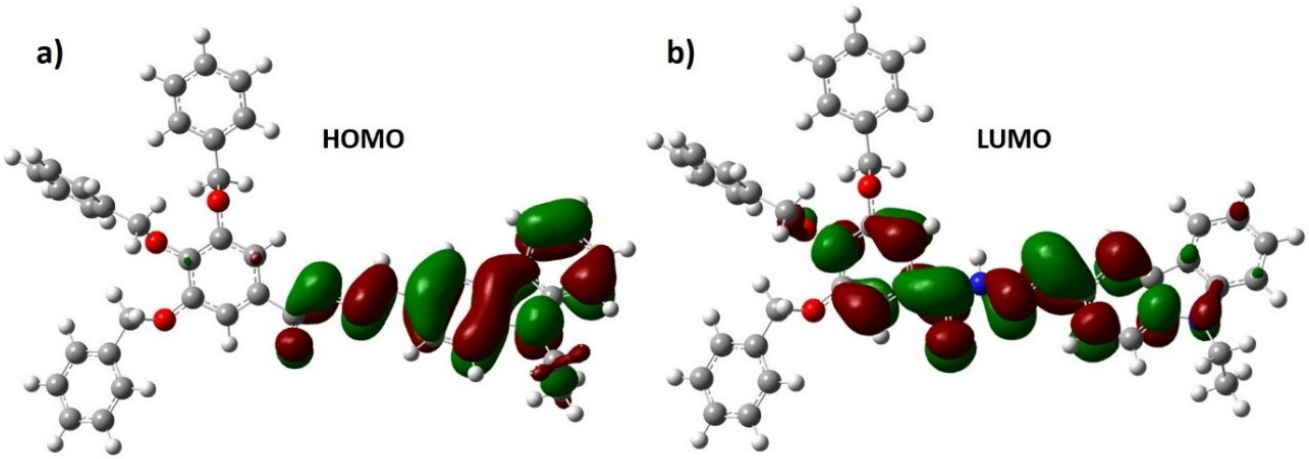


Figure SI-5. a) HOMO and b) LUMO orbitals in the optimized ground-state structure of CBG.

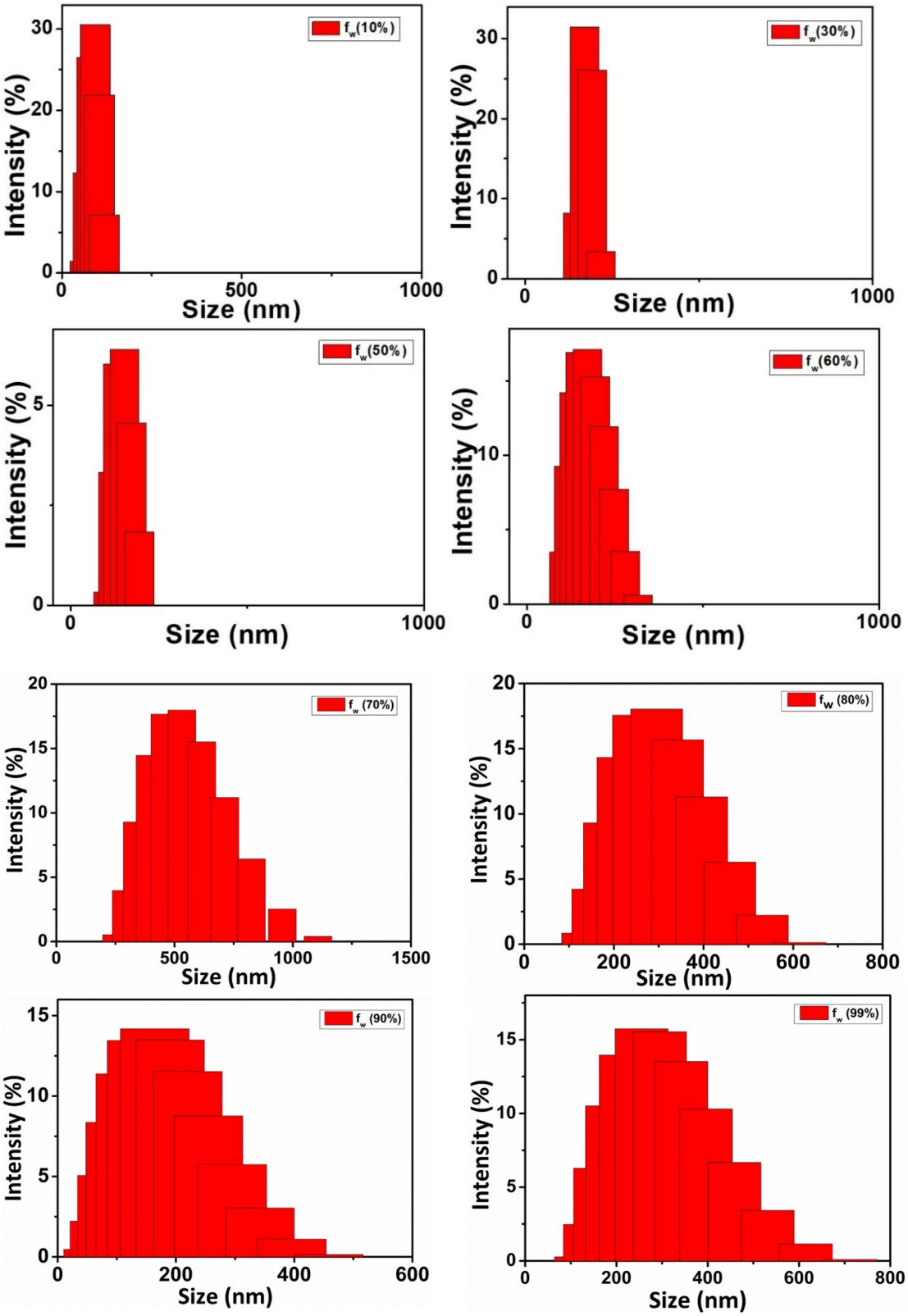


Figure SI-6. DLS traces of CBG in THF/H_2O mixtures at f_w = 10%, 30%, 50%, 60%, 70 %, 80 %, 90 %, 99%.

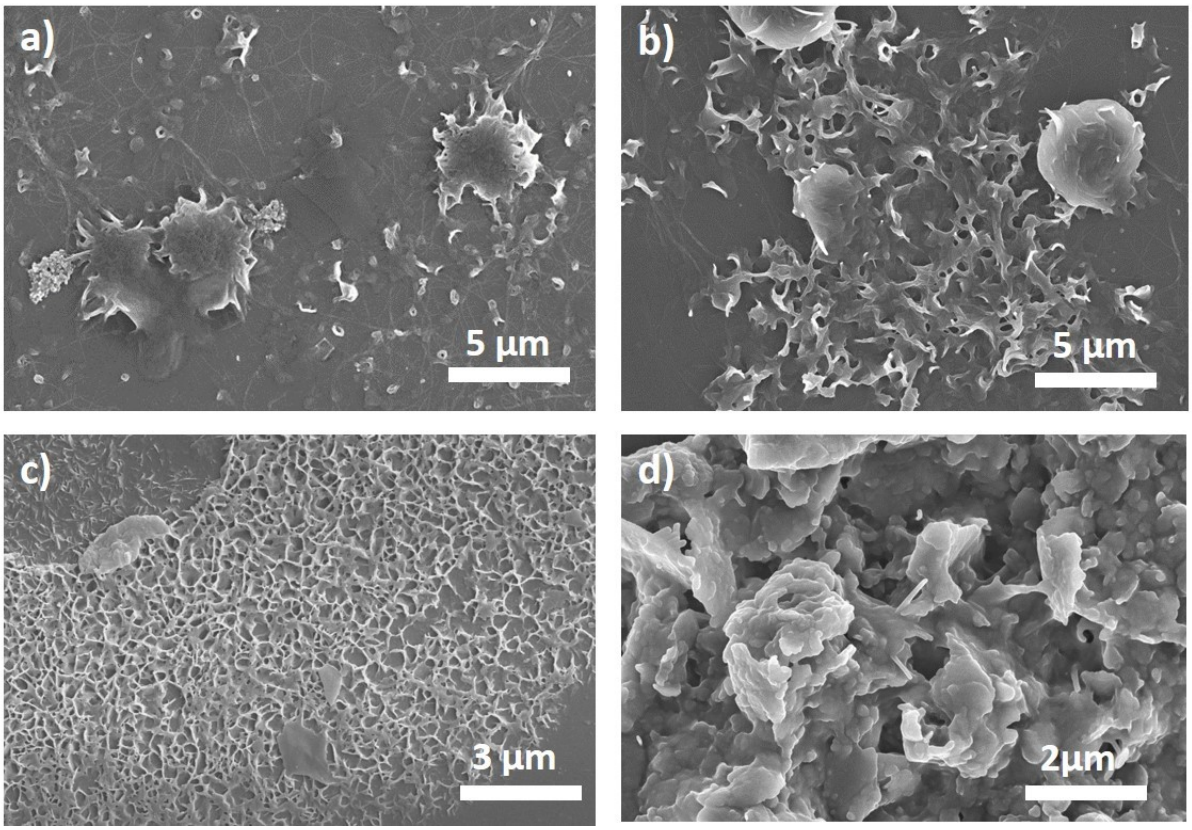


Figure SI-7. SEM images of a)10%, b) 30%, c) 50%, d) 60% water fractions

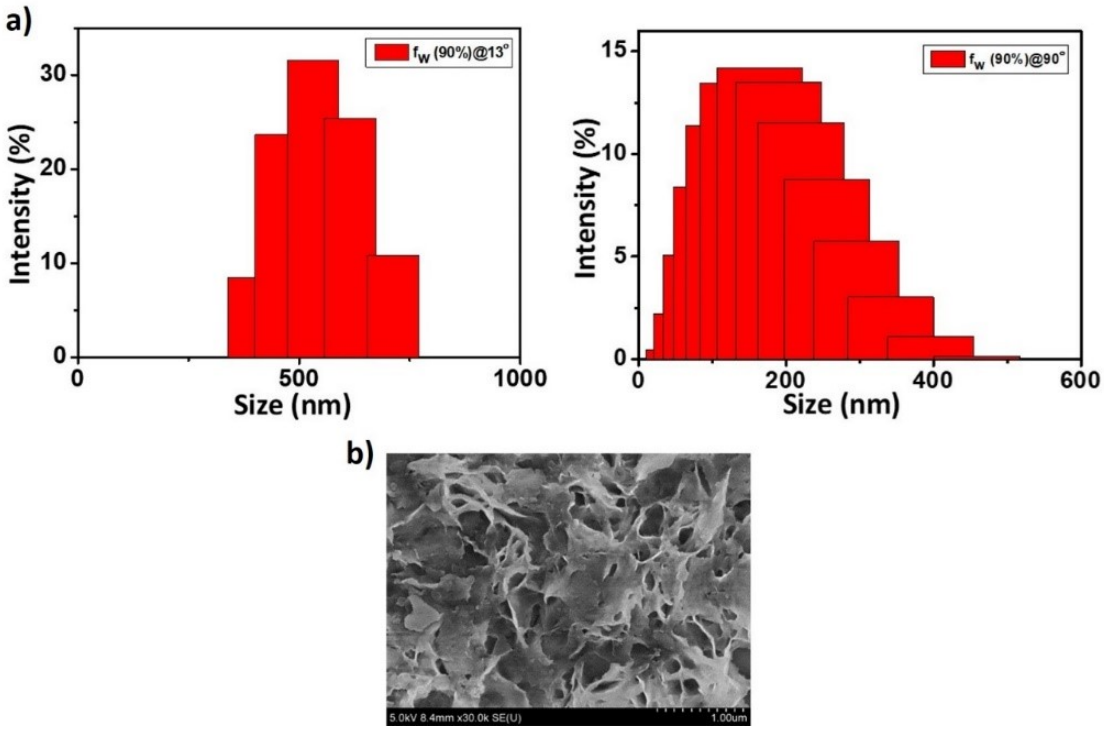


Figure SI-8. a) DLS traces of CBG (f_w=90%) in THF/H_2O mixtures at two different scattering angles (13°, 90°) and b) SEM image of f_w=90% (90:10).

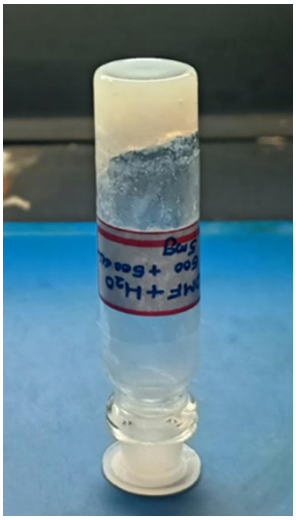


Figure SI-9. CBG gel in Dioxane-H_2O mixture.

Entry	Solvent	Phase (CGC)
1	$CHCl_3$	S
2	DCM	S
3	THF	S
4	DMSO	S
5	DMF	S
6	Dioxane	S
7	ACN	I
8	Hexane	I
9	DMF-H_2O (1:1)	G (5 mg)
10	Dioxane-H_2O (1:1)	G (5 mg)

Table SI-1. Table containing the details of gelation test.

(S: soluble, I: Insoluble G: gel formed)

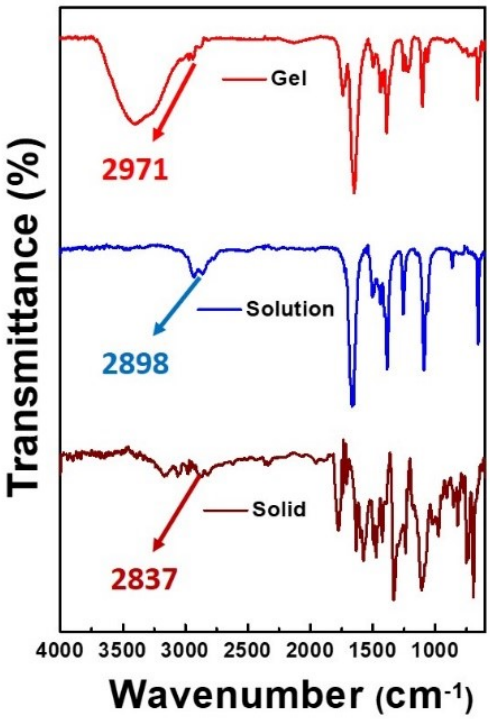


Figure SI-10. FT-IR spectra of CBG in its gel, solution and solid state

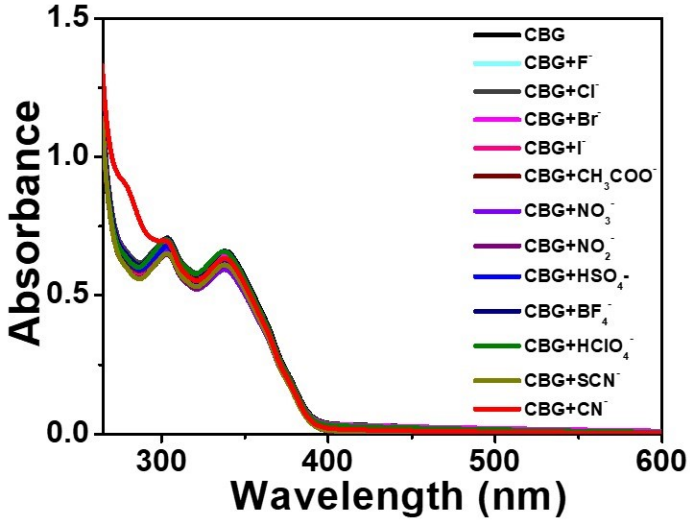


Figure SI-11. Absorption spectra changes upon addition of various anions as their tetra butyl ammonium salts.

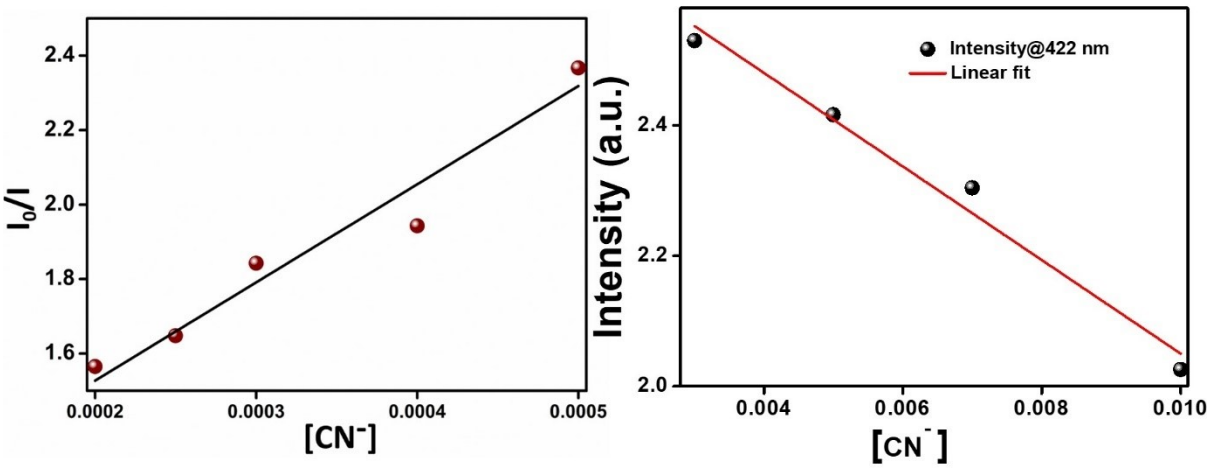


Figure SI-12. a) Stern-Volmer plot of CBG for CN^- sensing and b) determination of detection limit of CBG for CN^- sensing.

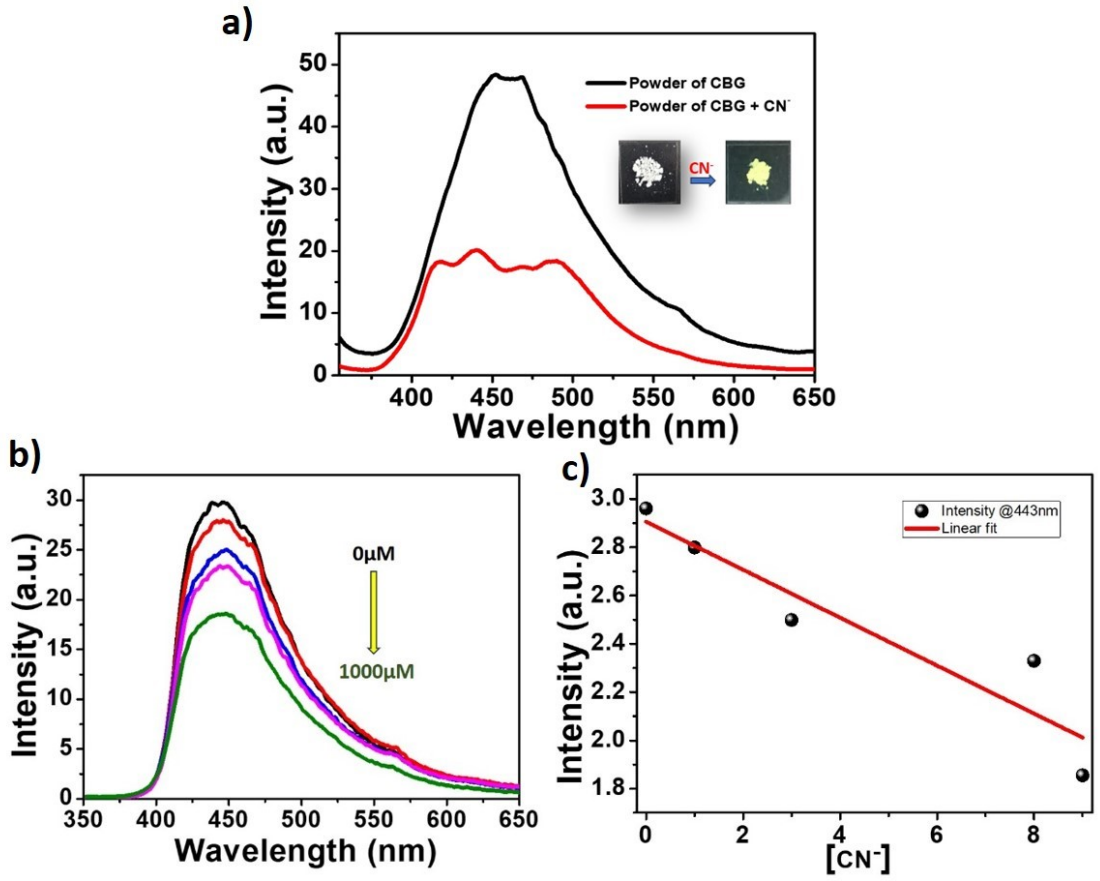


Figure SI-13. a) Emission spectra of CBG in its powder state and after treatment with CN^- b) Decrease in the emission intensity of CBG gel with increase in concentration of aq. CN^- and c) determination of detection limit of CBG gel for CN^- sensing.

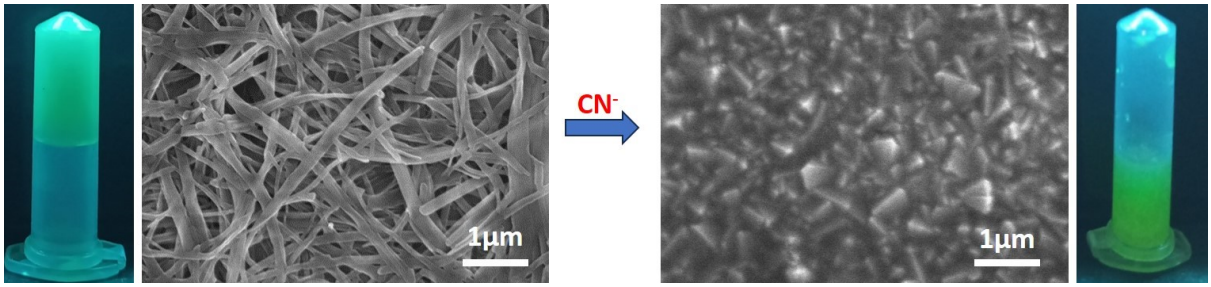


Figure SI-14. SEM image of CBG gel before and after addition on CN^-

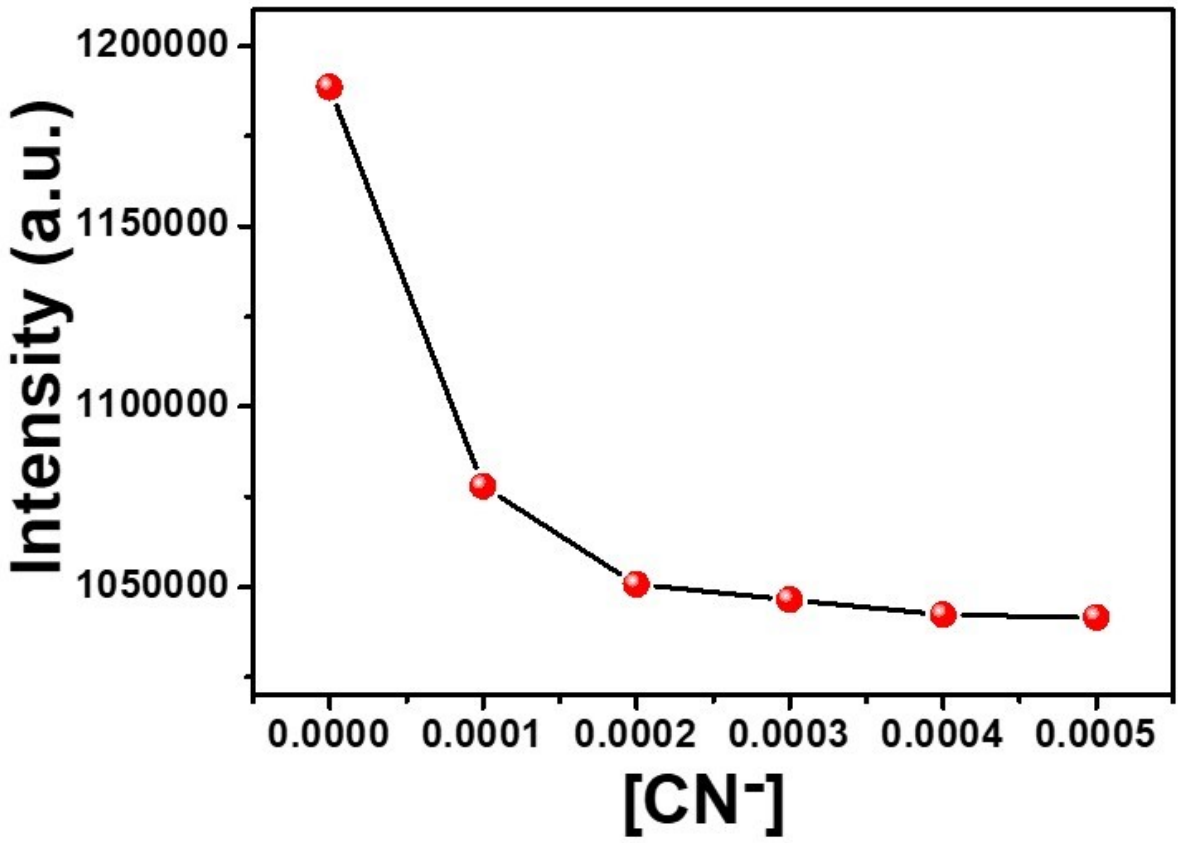
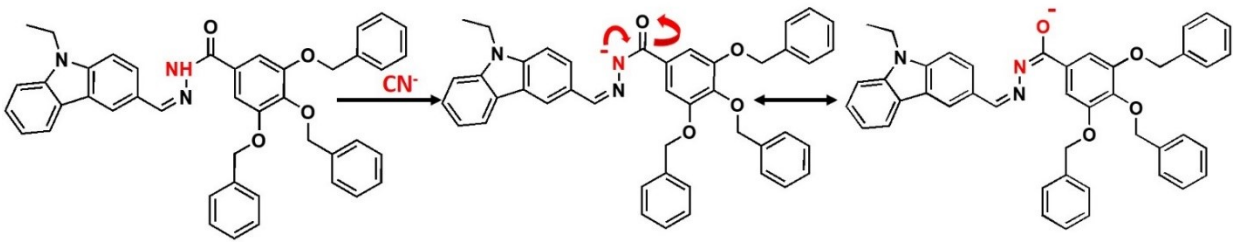


Figure SI-15. Decrease in fluorescence intensity with increase in concentration of CN^- in tap water.



Scheme SI-1. Deprotonation upon cyanide addition followed by the resonance stabilization.

Reference	Detection limit	Medium		
		Solution	Solid	Gel
1	0.28µM	Yes	-	-
2	20nM	Yes	-	-
3	67.4 nM	Yes	-	-
4	0.0153µM	Yes	-	-
5	51 nM	Yes	-	-
6	11nM	Yes	-	-
7	0.427µM	-	Yes	-
8	39.3 nM	Yes	Yes	-
9	0.5µM	Yes	Yes	-
10	3.02µM	Yes	-	Yes
Present study	1.28nM	Yes	Yes	Yes

Table SI-2. Comparison table of literature reports of cyanide sensing

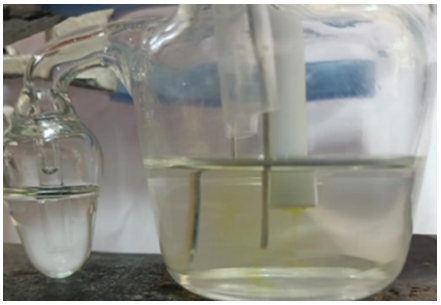


Figure SI-16. Yellow colour of the solution that appeared at 1.7 V.

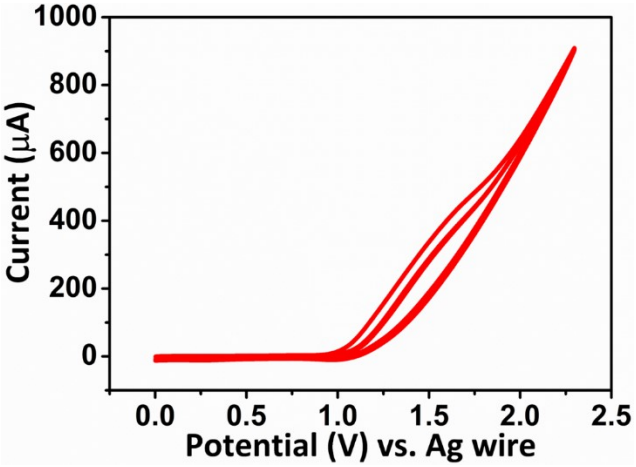


Figure SI-17. CV obtained when FTO plate is used as the working electrode.

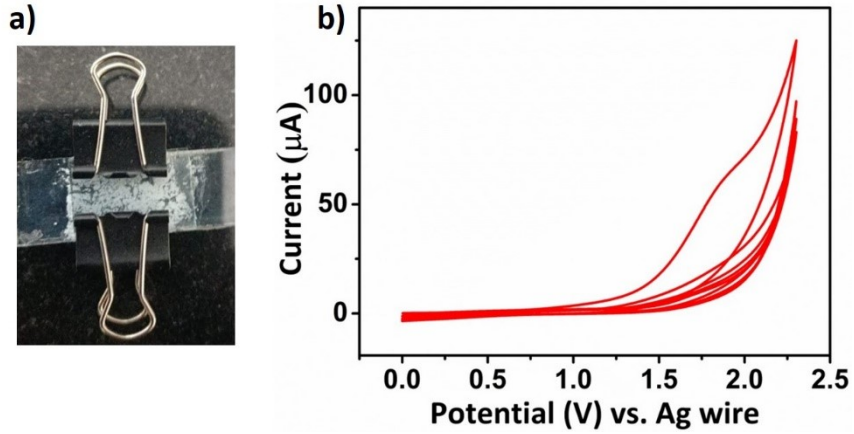


Figure SI-18. a) CBG gel sandwiched between FTO plates and b) CV in gel state.

References

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