

Fluorescent Carbon Dot – Molecular Salt Hydrogels

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Supplementary information

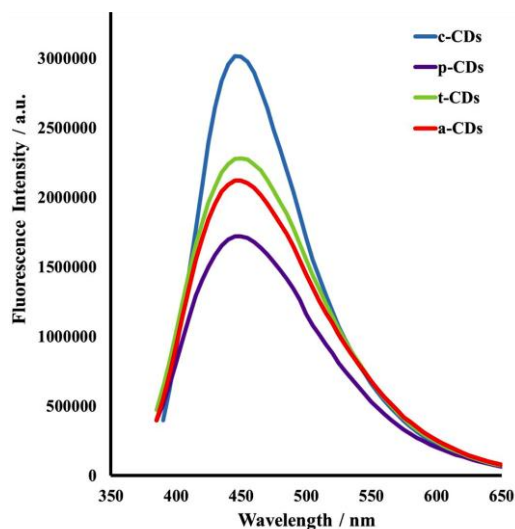


Figure S1. Fluorescence emission spectra of aqueous CD solutions (1 mg mL^{-1} , $\lambda_{\text{ex}} = 365 \text{ nm}$ for c-CD and $\lambda_{\text{ex}} = 370 \text{ nm}$ for the others).

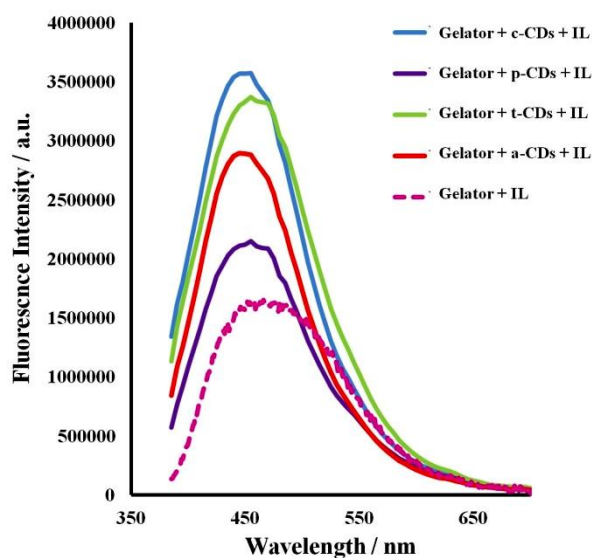


Figure S2. Fluorescence emission spectra of aqueous CD solutions (1 mg mL^{-1} , $\lambda_{\text{ex}} = 365 \text{ nm}$ for c-CD and $\lambda_{\text{ex}} = 370 \text{ nm}$ for the others) containing 1 w.t. % CD-gels with **1a** at the same CD concentration and 2% 1-butyl-3-methylimidazolium tetrafluoroborate (BMIM-BF₄).

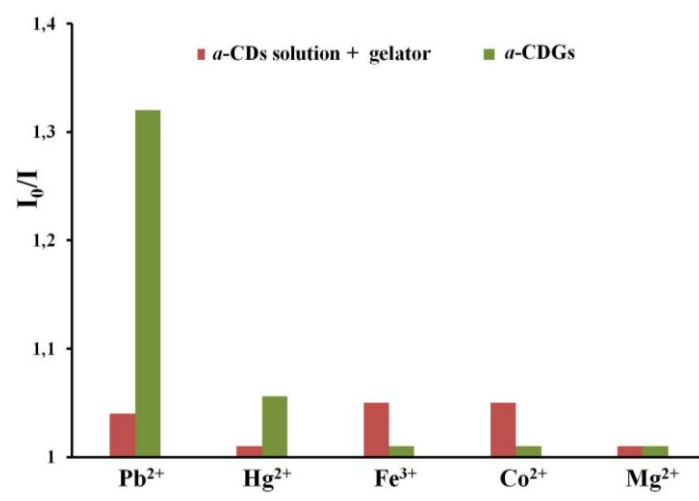


Figure S3. Photoluminescent response to $10 \mu\text{g mL}^{-1}$ of metal ions to α -CD solutions in the presence of dissolved gelator (1 mg mL^{-1}) and α -CD-containing hydrogels (α -CDGs) at $\lambda_{\text{ex}} = 370 \text{ nm}$ and $\lambda_{\text{em}} = 445 \text{ nm}$.

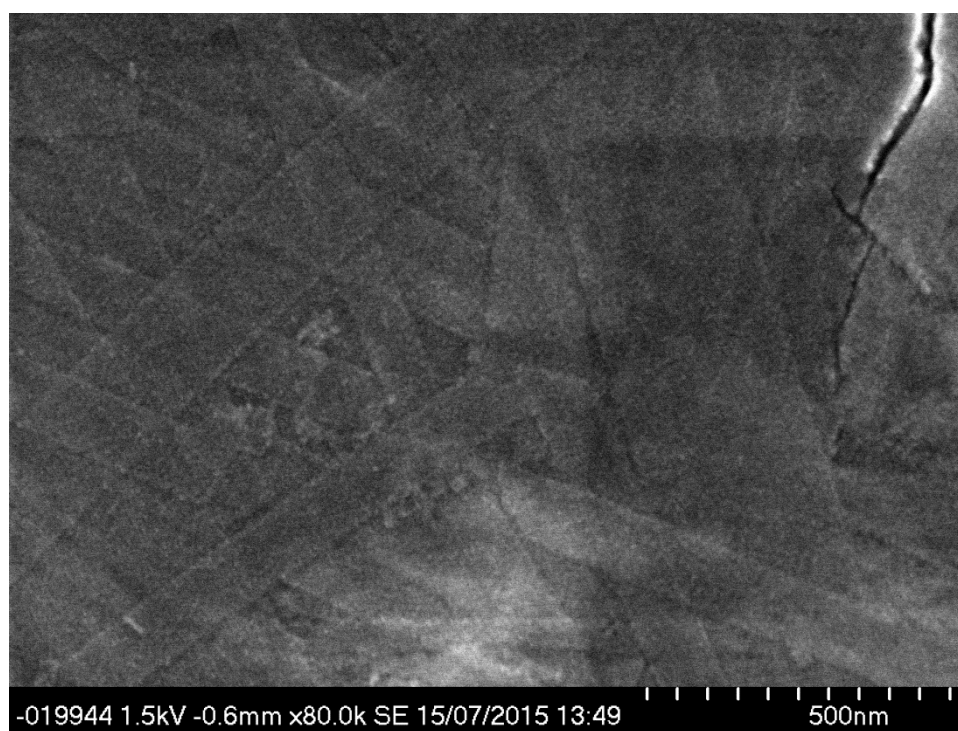


Figure S4. SEM micrograph of the chromium-coated xerogel of **1a** 1 wt%.

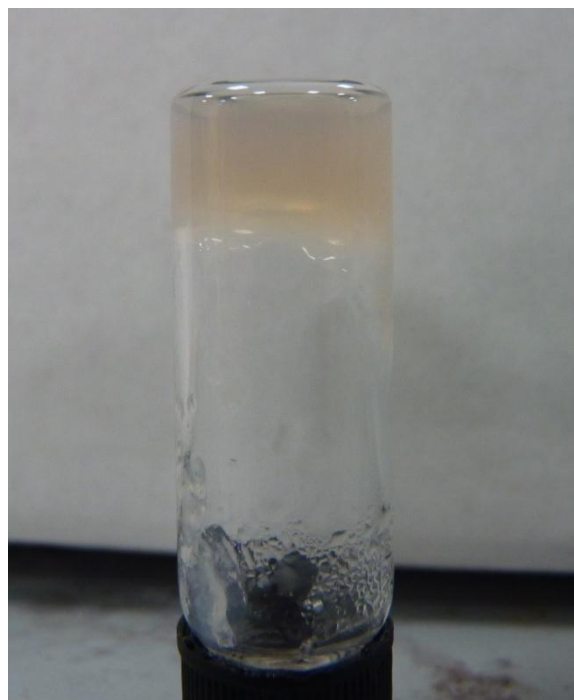


Figure S5 hydrogel of gelator **1a** at 2 wt% after standing for 1 day.

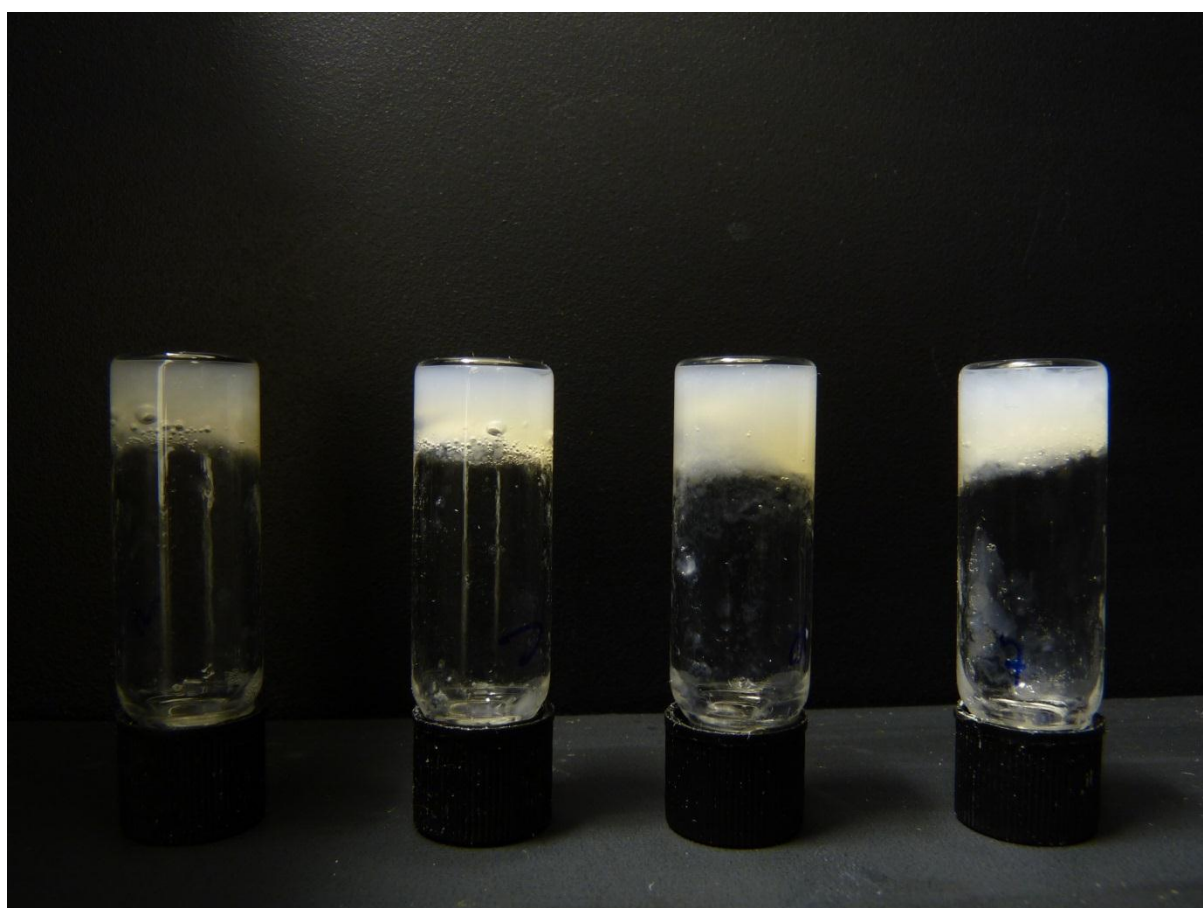


Figure S6 α -, γ -, p - and t -CD gels under ambient lighting, corresponding to Figure 6a in the main paper.

Gelation and solubility studies carried out on compounds **1a**, **1b**, **2a**, and **2b** are in tables S1-S5:

Solvent	30 min	4 h	24 h	48 h	72 h
1,2,4-trichlorobenzene	S	S	S	S	S
1,2-dibromoethane	PG	PG	S	S	S
2-butanone	G	CG	CG	CG	CG
1,2-dichlorobenzene	PG	PG	PG	PG	PG
1,3-dichlorobenzene	S	S	S	S	S
1,4-dioxane	G	G	G	G	CG
1-butanol	S	S	G	G	G
1-pentanol	G	G	G	G	G
1-propanol	G	G	G	G	G
2-butanol	G	G	G	G	G
2-Ethyl pyridine	G	G	G	G	G
2-Picoline	G	G	G	G	G
2-propanol	G	G	G	G	G
3-chloro-1-propanol	G	G	G	G	G
3-Picoline	G	G	G	G	G
4-Ethyl pyridine	G	G	G	G	G
4-Picoline	G	G	G	G	G
Acetic acid	S	G	G	G	G
Acetone	G	CG	CG	CG	CG
Acetonitrile	G	CG	CG	CG	CG
Benzene	I	I	I	I	I
Benzyl alcohol	G	G	G	G	G
Chlorobenzene	I	I	I	I	I
Chloroform	P	P	P	P	P
Cyclohexane	I	I	I	I	I
Cyclohexanone	PG	PG	PG	PG	P
Cyclopentanone	G	G	G	G	G
Dichloromethane	PG	PG	G	G	G
Diethyl ether	I	I	I	I	I
Diethylene glycol	S	S	S	S	S
Diisopropyl ether	I	I	I	I	I
Dimethylacetamide	S	S	S	S	S
DMF	G	G	G	G	G
DMSO	S	S	S	S	S
Ethanol	G	G	G	G	G
Ethyl acetate	I	I	I	I	I
Ethylene glycol	S	S	S	S	S
Ethylene glycol butyl ether	G	G	G	CG	CG
Hexane	I	I	I	I	I
Mesitylene	I	I	I	I	I
Methanol	P	P	P	P	P
Nitrobenzene	G	G	G	G	G
Nitromethane	S	S	G	G	CG
o-xylene	I	I	I	I	I
p-xylene	I	I	I	I	I
Pyridine	G	G	G	G	G
THF	I	I	I	I	I
Toluene	I	I	I	I	I
Triethylene glycol	S	S	S	S	S
Water	S	S	S	S	PG

Table S1. Gelation behaviour of **1a** as a function of time. The compound (1 w.t. %) was dissolved in the relevant solvent at elevated temperature and allowed to cool to ambient temperature on the bench top. Categories are self-supporting gel according to the inversion test (G) partial gel formation (PG), collapsed gel (CG) solution (S), rapid precipitate formed from solution (P), insoluble (I). All experiments used increased temperatures to form gels.

Solvent	30 min	4 h	24 h	48 h	72 h
1,2,4-trichlorobenzene	I	I	I	I	I
1,2-dibromoethane	I	I	I	I	I
2-butanone	I	I	I	I	I
1,2-dichlorobenzene	I	I	I	I	I
1,3-dichlorobenzene	I	I	I	I	I
1,4-dioxane	I	I	I	I	I
1-butanol	S	S	G	G	G
1-pentanol	S	S	G	G	G
1-propanol	S	S	S	S	PG
2-butanol	S	S	S	S	PG
2-Ethyl pyridine	G	G	G	PG	PG
2-Picoline	S	S	S	PG	PG
2-propanol	S	S	S	S	PG
3-chloro-1-propanol	I	I	I	I	I
3-Picoline	G	G	G	G	G
4-Ethyl pyridine	S	S	G	G	G
4-Picoline	S	S	S	S	PG
Acetic acid	PG	PG	PG	PG	CG
Acetone	I	I	I	I	I
Acetonitrile	I	I	I	I	I
Benzene	I	I	I	I	I
Benzyl alcohol	G	G	G	G	G
Chlorobenzene	I	I	I	I	I
Chloroform	I	I	I	I	I
Cyclohexane	I	I	I	I	I
Cyclohexanone	S	S	S	S	PG
Cyclopentanone	I	I	I	I	I
Dichloromethane	I	I	I	I	I
Diethyl ether	I	I	I	I	I
Diethylene glycol	G	G	G	G	G
Diisopropyl ether	I	I	I	I	I
Dimethylacetamide	S	S	S	S	S
DMF	S	S	S	S	S
DMSO	S	S	S	S	S
Ethanol	G	G	G	G	G
Ethyl acetate	I	I	I	I	I
Ethylene glycol	G	G	G	G	G
Ethylene glycol butyl ether	S	S	S	S	PG
Hexane	I	I	I	I	I
Mesitylene	I	I	I	I	I
Methanol	PG	PG	PG	PG	PG
Nitrobenzene	I	I	I	I	I
Nitromethane	I	I	I	I	I
o-xylene	I	I	I	I	I
p-xylene	I	I	I	I	I
Pyridine	G	G	G	G	G
THF	PG	PG	PG	G	G
Toluene	I	I	I	I	I
Triethylene glycol	G	PG	PG	PG	PG
Water	I	I	I	I	I

Table S2. Gelation behaviour of **1b** as a function of time. The compound (1 w.t. %) was dissolved in the relevant solvent at elevated temperature and allowed to cool to ambient temperature on the bench top. Categories are self-supporting gel according to the inversion test (G) partial gel formation (PG), collapsed gel (CG) solution (S), insoluble (I). All experiments used increased temperatures to form gels.

Solvent	30 min	4 h	24 h	48 h	72 h
1-propanol	G	G	G	CG	CG
2-Ethyl pyridine	PG	PG	PG	PG	PG
2-Picoline	PG	G	G	G	G
3-chloro-1-propanol	PG	G	G	G	G
3-Picoline	G	G	G	G	G
4-Ethyl pyridine	G	G	G	G	G
4-Picoline	G	G	G	G	G
Ethanol	G	CG	CG	CG	CG
Acetone	G	G	CG	CG	CG
Methanol	PG	PG	PG	PG	PG
Pyridine	G	G	G	G	G

Table S3. Gelation experiments carried out on compound **1a** recorded at various times listing whether gels formed (G), a partial gel formed (PG), a collapsed gel was observed (CG) or a solution was observed (S). All experiments were carried out using only sonication as a mechanism to induce gelation.

Solvent	30 min	4 h	24 h	48 h	72 h
1,2,4-trichlorobenzene	S	S	S	S	S
1,2-dibromoethane	S	S	S	S	S
2-butanone	S	S	S	S	S
1,2-dichlorobenzene	S	S	S	S	S
1,3-dichlorobenzene	S	S	S	S	S
1,4-dioxane	S	S	S	S	S
1-butanol	S	S	S	S	S
1-pentanol	S	S	S	S	S
1-propanol	S	S	S	S	X
2-butanol	S	S	S	S	S
2-Ethyl pyridine	S	S	S	S	S
2-Picoline	S	S	S	S	S
2-propanol	S	S	S	S	S
3-chloro-1-propanol	S	S	S	S	S
3-Picoline	S	S	S	S	S
4-Ethyl pyridine	S	S	S	S	S
4-Picoline	S	S	S	S	S
Acetic acid	S	S	S	S	S
Acetone	I	I	I	I	I
Acetonitrile	I	I	I	I	I
Benzene	I	I	I	I	I
Benzyl alcohol	S	S	S	S	S
Chlorobenzene	I	I	I	I	I
Chloroform	I	I	I	I	I
Cyclohexane	I	I	I	I	I
Cyclohexanone	S	S	S	S	S
Cyclopentanone	S	S	S	S	S
Dichloromethane	I	I	I	I	I
Diethyl ether	I	I	I	I	I
Diethylene glycol	S	S	S	S	S
Diisopropyl ether	I	I	I	I	I
Dimethylacetamide	S	S	S	S	S
DMF	S	S	S	S	S
DMSO	S	S	S	S	S
Ethanol	S	S	S	S	S
Ethyl acetate	I	I	I	I	I
Ethylene glycol	S	S	S	S	S
Ethylene glycol butyl ether	S	S	S	S	S
Hexane	I	I	I	I	I
Mesitylene	I	I	I	I	I
Methanol	S	S	S	S	S
Nitrobenzene	S	S	S	S	S
Nitromethane	S	S	S	S	S
o-xylene	I	I	I	I	I
p-xylene	I	I	I	I	I
Pyridine	S	S	S	S	S
THF	I	I	I	I	I
Toluene	I	I	I	I	I
Triethylene glycol	S	S	S	S	S
Water	S	S	S	S	S

Table S4. Solubility studies of **2a** as a function of time. The compound (1 w.t. %) was dissolved in the relevant solvent at elevated temperature and allowed to cool to ambient temperature on the bench top. Categories are solution (S), insoluble (I) crystals formed (X).

Solvent	30 min	4 h	24 h	48 h	72 h
1,2,4-trichlorobenzene	I	I	I	I	I
1,2-dibromoethane	I	I	I	I	I
2-butanone	I	I	I	I	I
1,2-dichlorobenzene	I	I	I	I	I
1,3-dichlorobenzene	I	I	I	I	I
1,4-dioxane	I	I	I	I	I
1-butanol	S	S	S	S	S
1-pentanol	S	S	S	S	S
1-propanol	S	S	S	S	S
2-butanol	S	S	S	S	S
2-Ethyl pyridine	S	S	S	S	S
2-Picoline	S	S	S	S	S
2-propanol	S	S	S	S	S
3-chloro-1-propanol	S	S	S	S	S
3-Picoline	S	S	S	S	S
4-Ethyl pyridine	S	S	S	S	S
4-Picoline	S	S	S	S	S
Acetic acid	S	S	S	S	S
Acetone	S	S	S	S	S
Acetonitrile	S	S	S	S	S
Benzene	I	I	I	I	I
Benzyl alcohol	S	S	S	S	S
Chlorobenzene	I	I	I	I	I
Chloroform	I	I	I	I	I
Cyclohexane	I	I	I	I	I
Cyclohexanone	S	S	S	S	S
Cyclopentanone	S	S	S	S	S
Dichloromethane	I	I	I	I	I
Diethyl ether	I	I	I	I	I
Diethylene glycol	S	S	S	S	S
Diisopropyl ether	I	I	I	I	I
Dimethylacetamide	S	S	S	S	S
DMF	S	S	S	S	S
DMSO	S	S	S	S	S
Ethanol	S	S	S	S	S
Ethyl acetate	I	I	I	I	I
Ethylene glycol	S	S	S	S	S
Ethylene glycol butyl ether	S	S	S	S	S
Hexane	I	I	I	I	I
Mesitylene	I	I	I	I	I
Methanol	S	S	S	S	S
Nitrobenzene	I	I	I	I	I
Nitromethane	I	I	I	I	I
o-xylene	I	I	I	I	I
p-xylene	I	I	I	I	I
Pyridine	S	S	S	S	S
THF	S	S	S	S	S
Toluene	I	I	I	I	I
Triethylene glycol	S	S	S	S	S
Water	I	I	I	I	I

Table S5. Solubility studies of **2b** as a function of time. The compound (1 w.t. %) was dissolved in the relevant solvent at elevated temperature and allowed to cool to ambient temperature on the bench top. Categories are solution (S), insoluble (I) crystals formed (X).