Electronic Supplementary Information

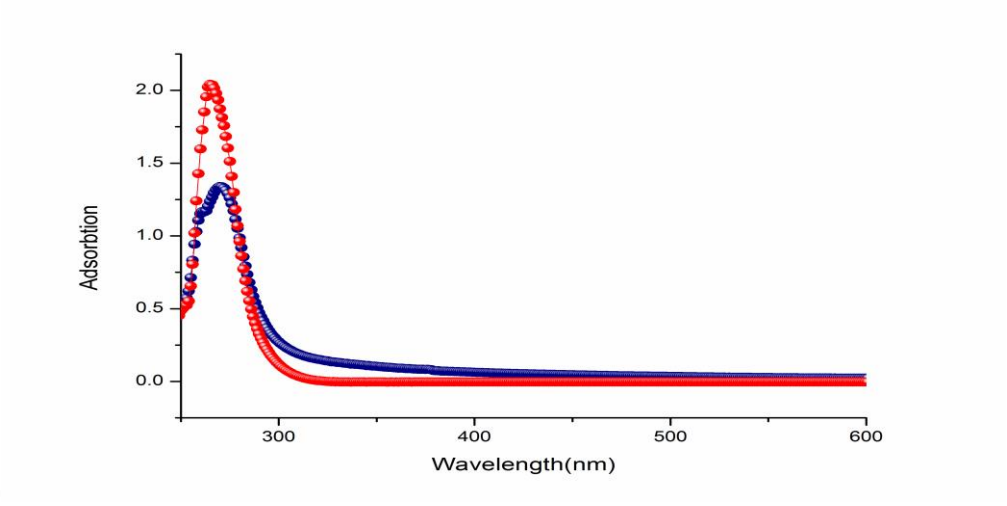
A Novel Metallogel Based Approach to Doped ZnS Quantum Dot Synthesis Using a Gelator cum Capping Agent

Soumya Bhowal*[a], Arijit Ghosh [b], Srijita Paul Chowdhuri [b], Raju Mondal*[a], Benu Brata Das*[b]

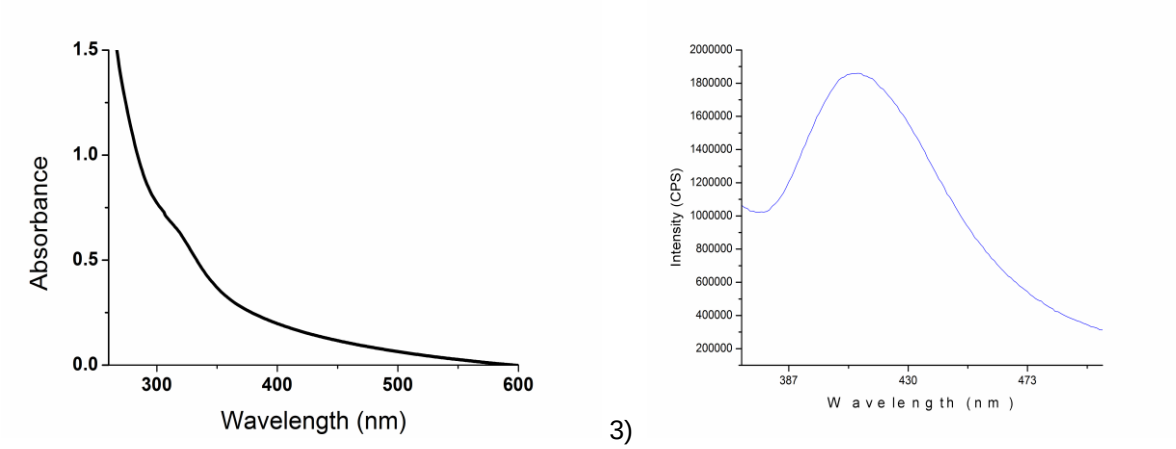
a) Department of Inorganic Chemistry, Indian Association for the Cultivation of Science, Raja S. C. Mullick Road, Kolkata-700032, India.

b) Department of Biological Chemistry, Indian Association for the Cultivation of Science, Raja S. C. Mullick Road, Kolkata-700032, India.

UV-Vis and PL data



1)



2) 3)

Figure S1. UV-Visible spectrum of 1) ligand and gel (a) the red sphere curve represents ligand and (b) blue sphere represents gel, 2) UV-VIS curve of ZnS in gel (a hump at 318), 3) PL curve of ZnS at 410 nm with excitation wavelength 300 nm.

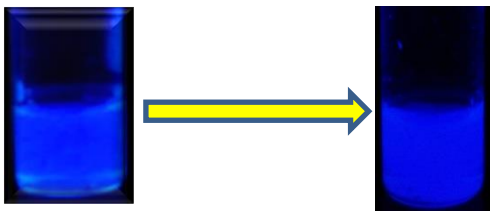
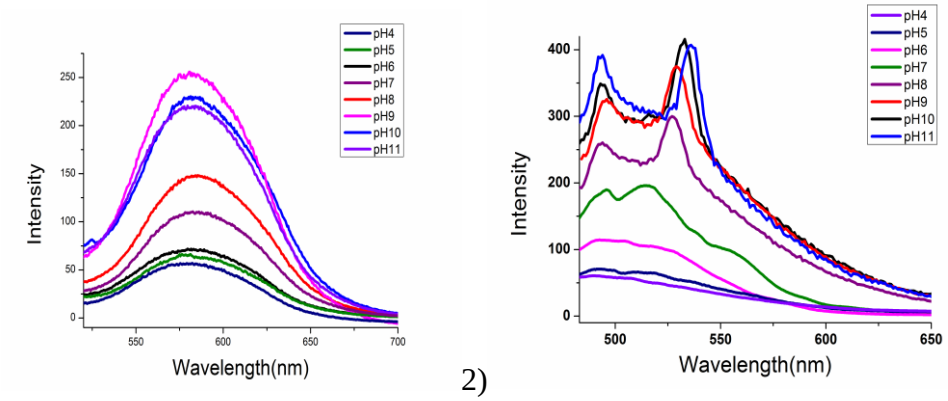


Figure S2. Images representing gel luminescence at 365 nm. First image is of pristine Al-PDC gel. Second image is of undoped ZnS incubated gel.

PL DATA

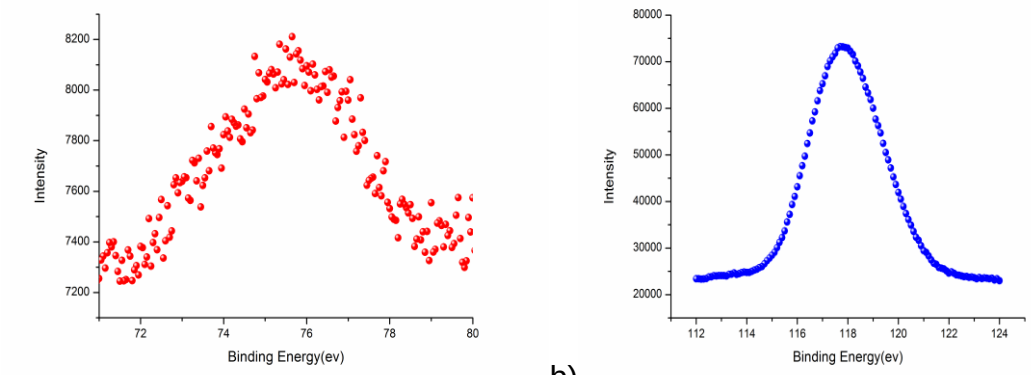
Pl of the gel based QDs in different pH



1) 2)

Figure S3. Photoluminescence plot in pH 4-11 of 1) Mn:ZnS, 2) Cu:ZnS.

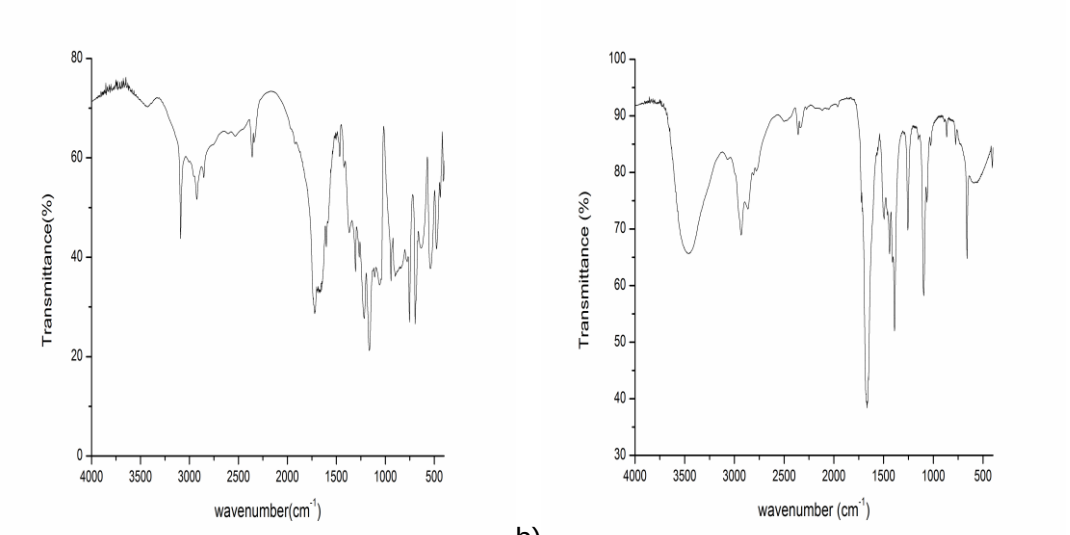
XPS DATA



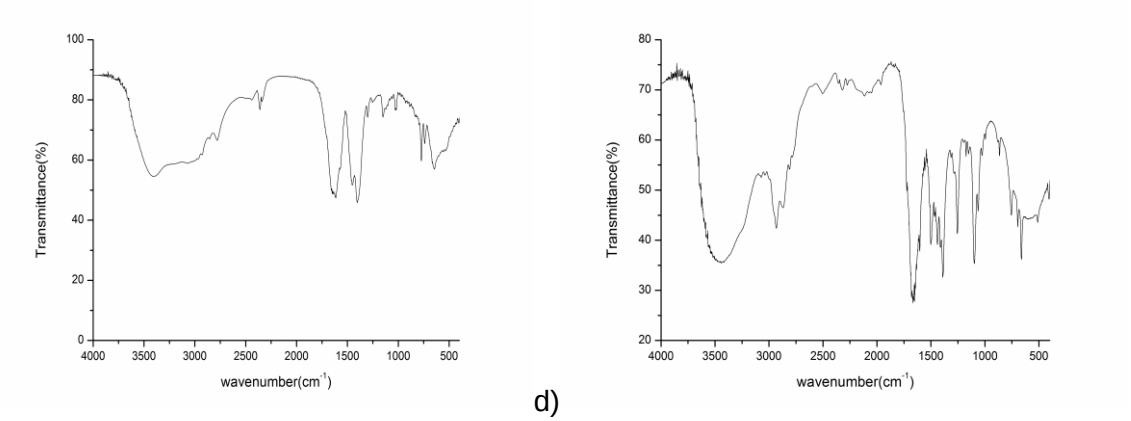
a) b)

Figure S4. (a) curve representing XPS data for $2p_{3/2}$ and (b) 2s respectively.

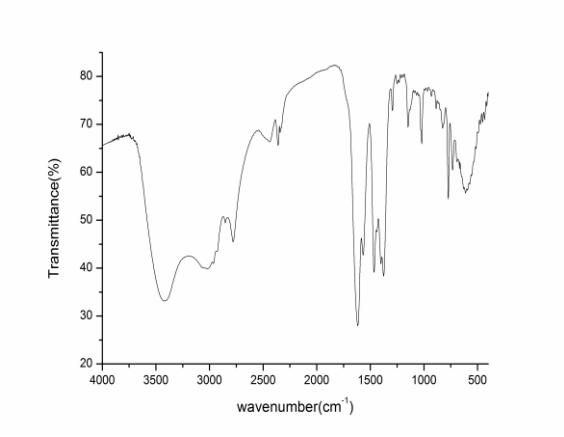
FTIR data



a) b)



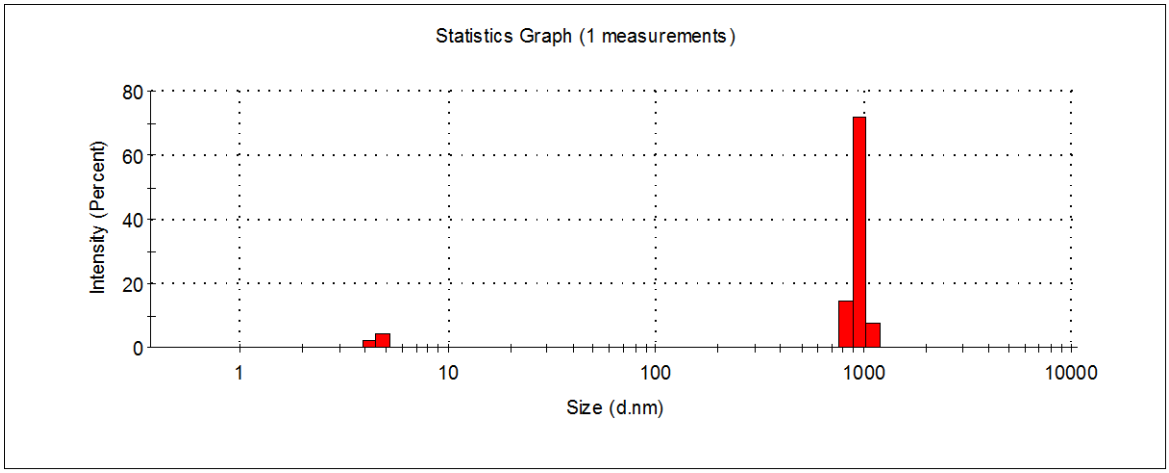
c) d)



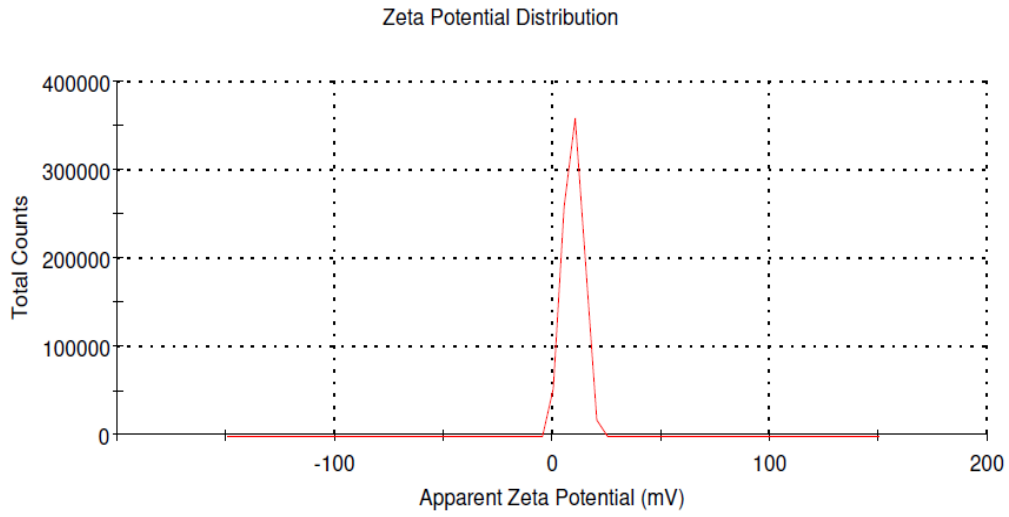
e)

Figure S5. FTIR data of (a) ligand, (b) gel, (c) xerogel, (d) doped ZnS incubated gel, (e) doped ZnS incubated xerogel

DLS and ζ-potential

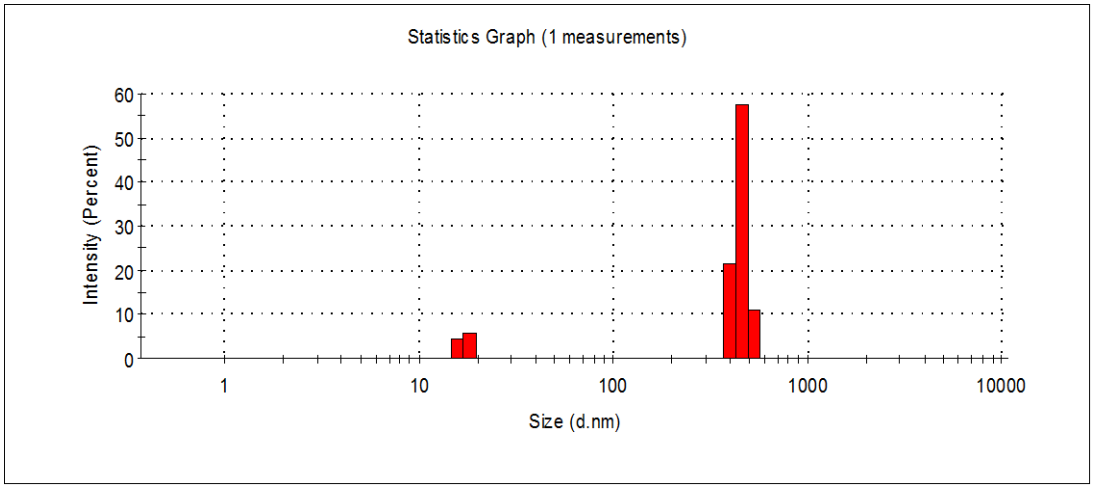


a)



b)

c)



d)

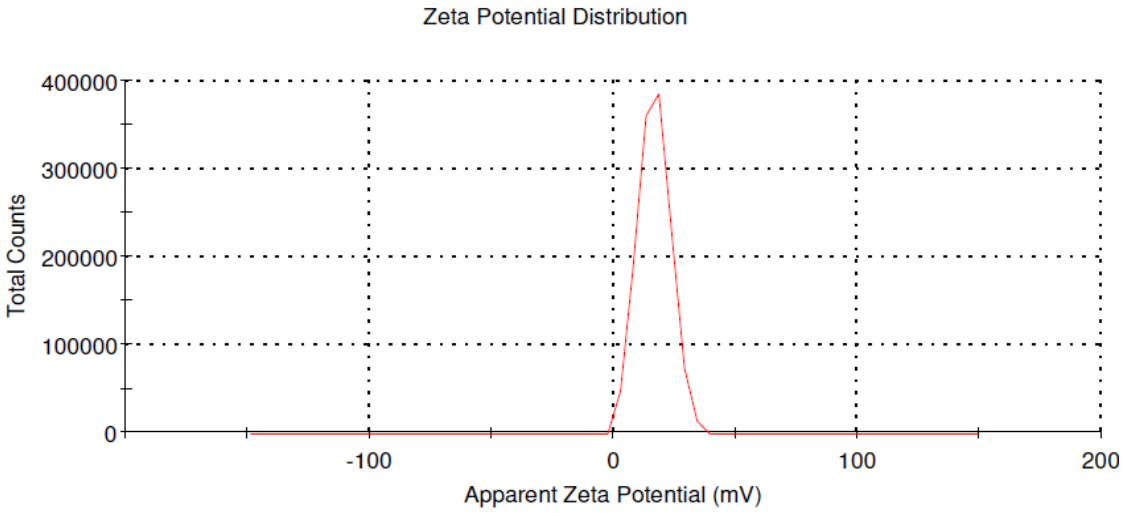
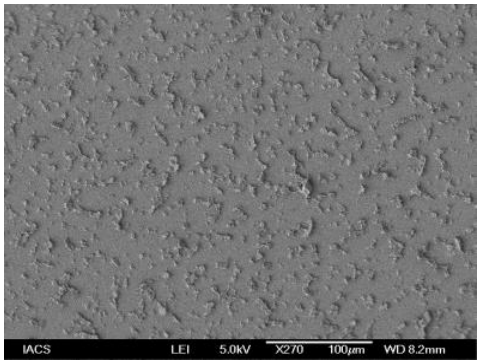


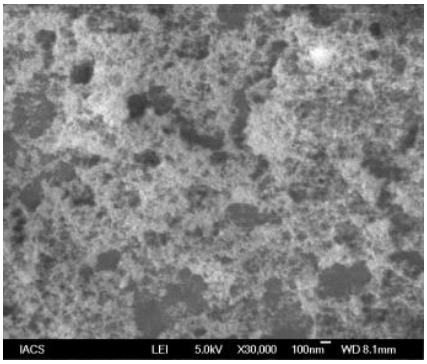
Figure S6. DLS data showing (a) Intensity vs size of Mn:ZnS, (b) ζ-potential of Mn:ZnS, (c) Intensity vs size of Cu:ZnS, (d) ζ-potential of Cu:ZnS.

SEM images

a)



b)



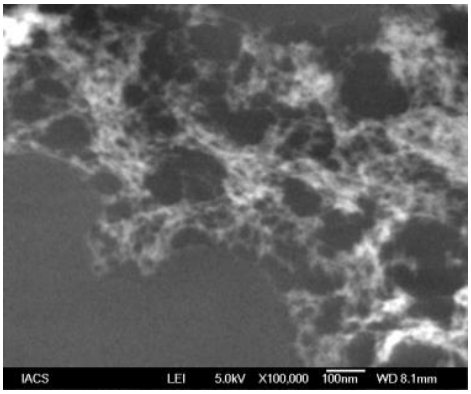
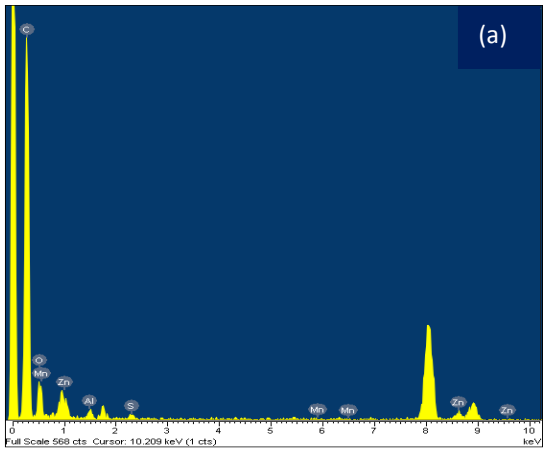
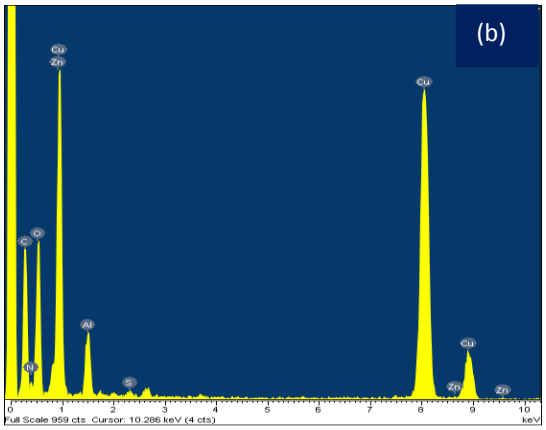
c) 

Figure S7. SEM images of Al-PDC Gel.

EDS DATA



Element	Peak Area	Area Sigma	k factor	Abs Corrn.	Weight%	Weight% Sigma	Atomic %
C K	3929	111	2.208	1.000	88.78	1.02	92.66
O K	424	42	1.810	1.000	7.85	0.74	6.15
Al K	137	24	1.044	1.000	1.46	0.26	0.68
S K	76	26	0.940	1.000	0.73	0.25	0.29
Mn K	6	33	1.153	1.000	0.07	0.39	0.02
Zn K	75	39	1.434	1.000	1.10	0.57	0.21
Totals					100.00		



Element	Peak Area	Area Sigma	k factor	Abs Corrn.	Weight %	Weight % Sigma	Atomic %
C K	2813	107	2.208	1.000	18.01	0.60	39.60
N K	269	68	2.965	1.000	2.31	0.57	4.36
O K	3104	103	1.810	1.000	16.30	0.50	26.90
Al K	1551	75	1.044	1.000	4.69	0.23	4.59
S K	145	43	0.940	1.000	0.40	0.12	0.33
Cu K	14662	201	1.366	1.000	58.07	0.72	24.13
Zn K	53	43	1.434	1.000	0.22	0.18	0.09
Totals					100.00		

Figure S8: EDS data of a) Mn:ZnS and b) Cu:ZnS.

Self healing

Figure S9. Images of self -healing experiment.