Electronic Supplementary Material (ESI) for RSC Advances.

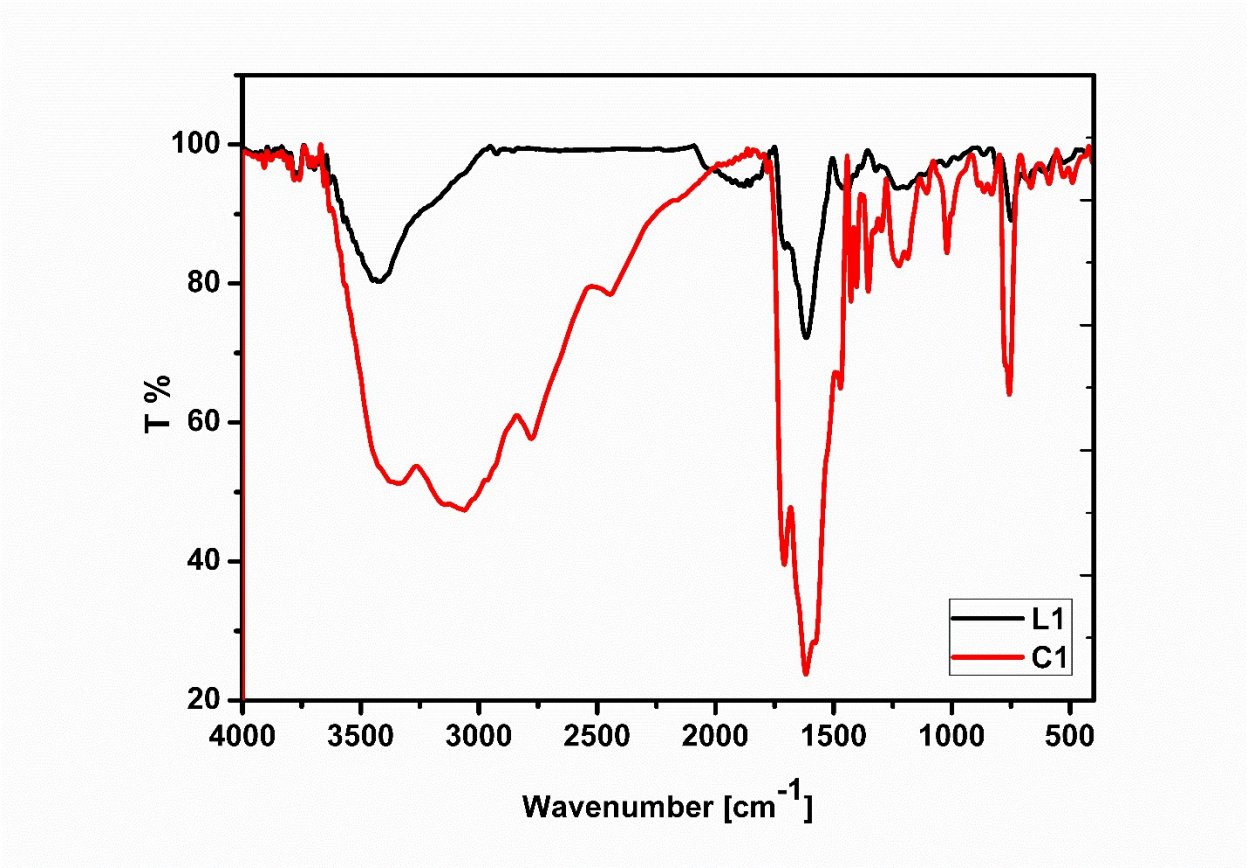


Fig. S1: The FT-IR spectra of Schiff base **L1**, and Ce(III)-complex **C1**.

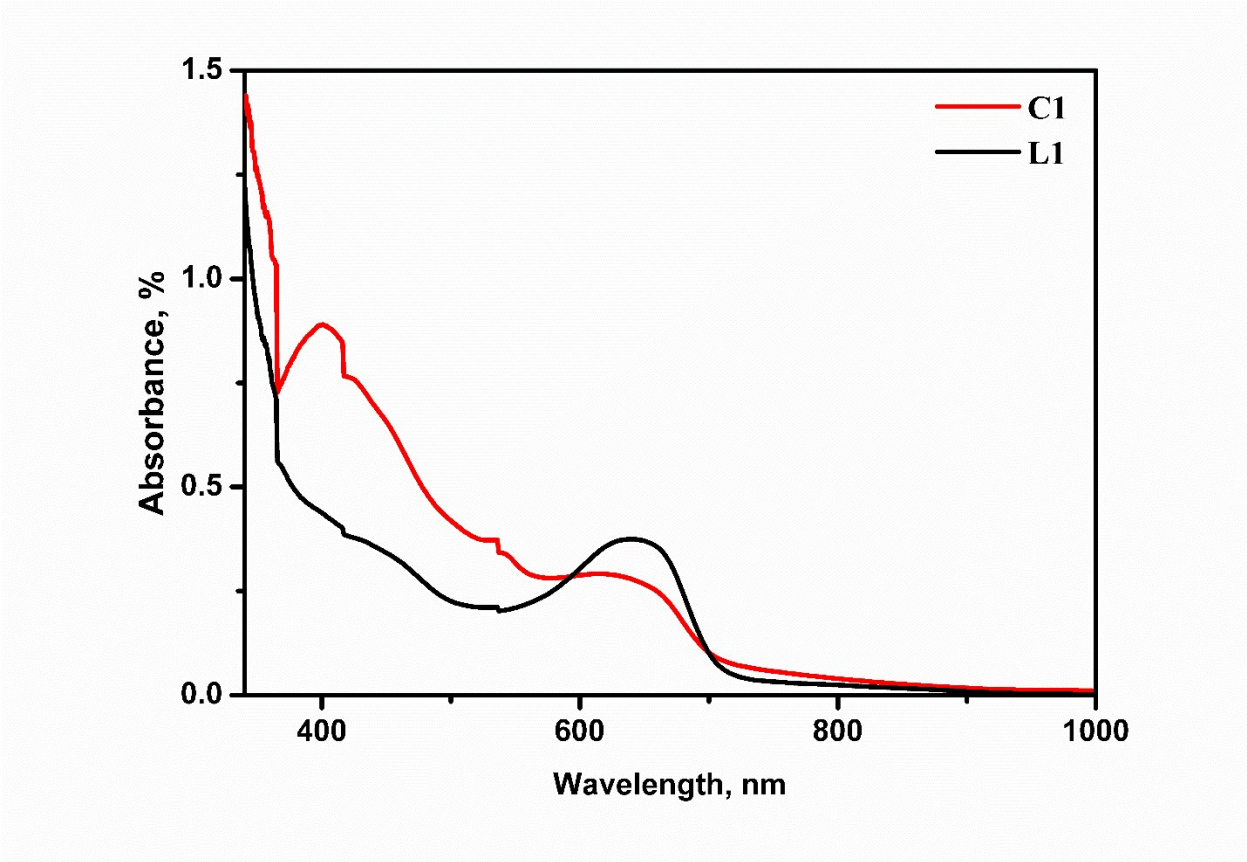


Fig. S2: The electronic absorption spectra of Schiff base **L1**, and Ce(III)-complex **C1**.

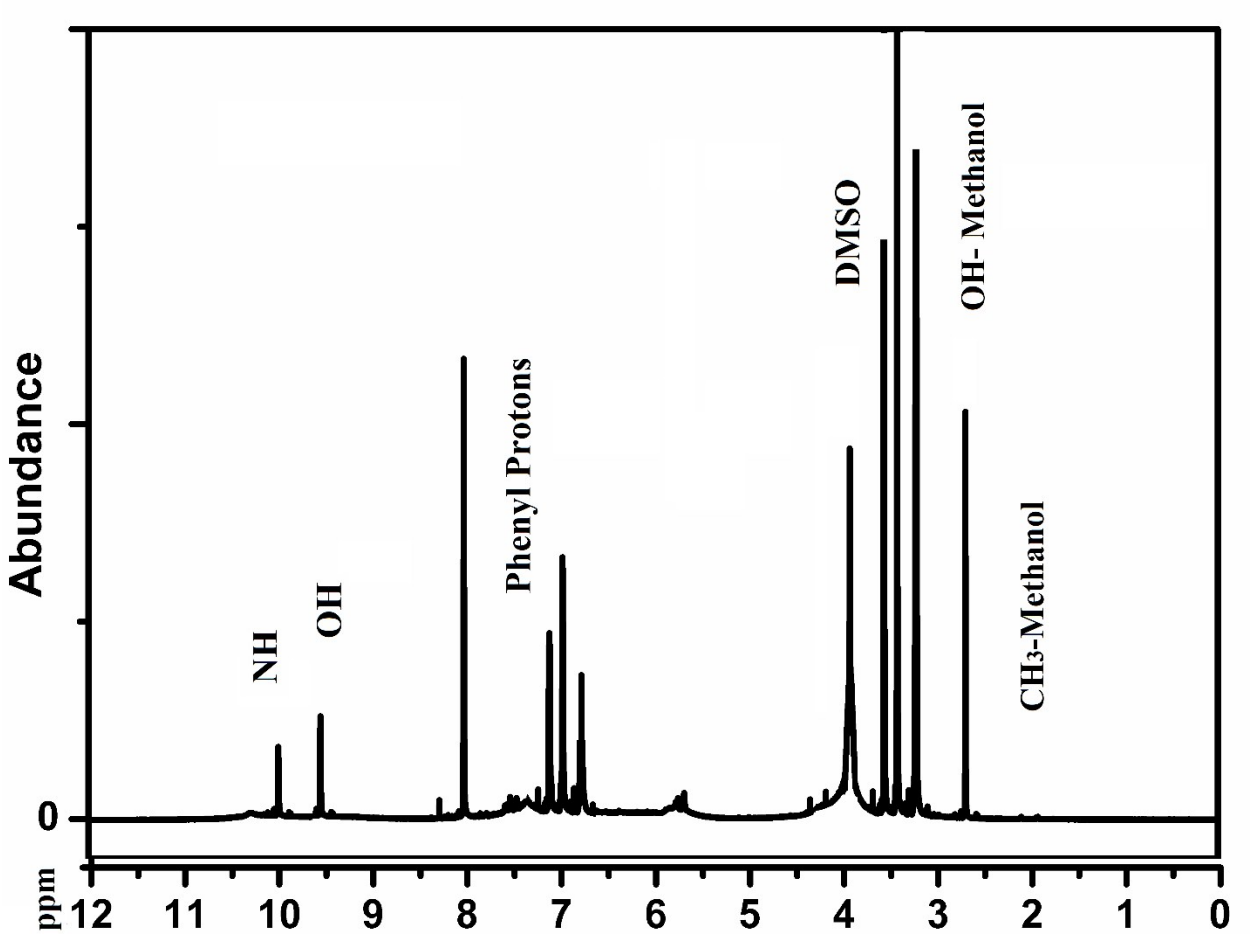


Fig. S3: The ^{1}H-NMR spectrum of Schiff base **L1**.

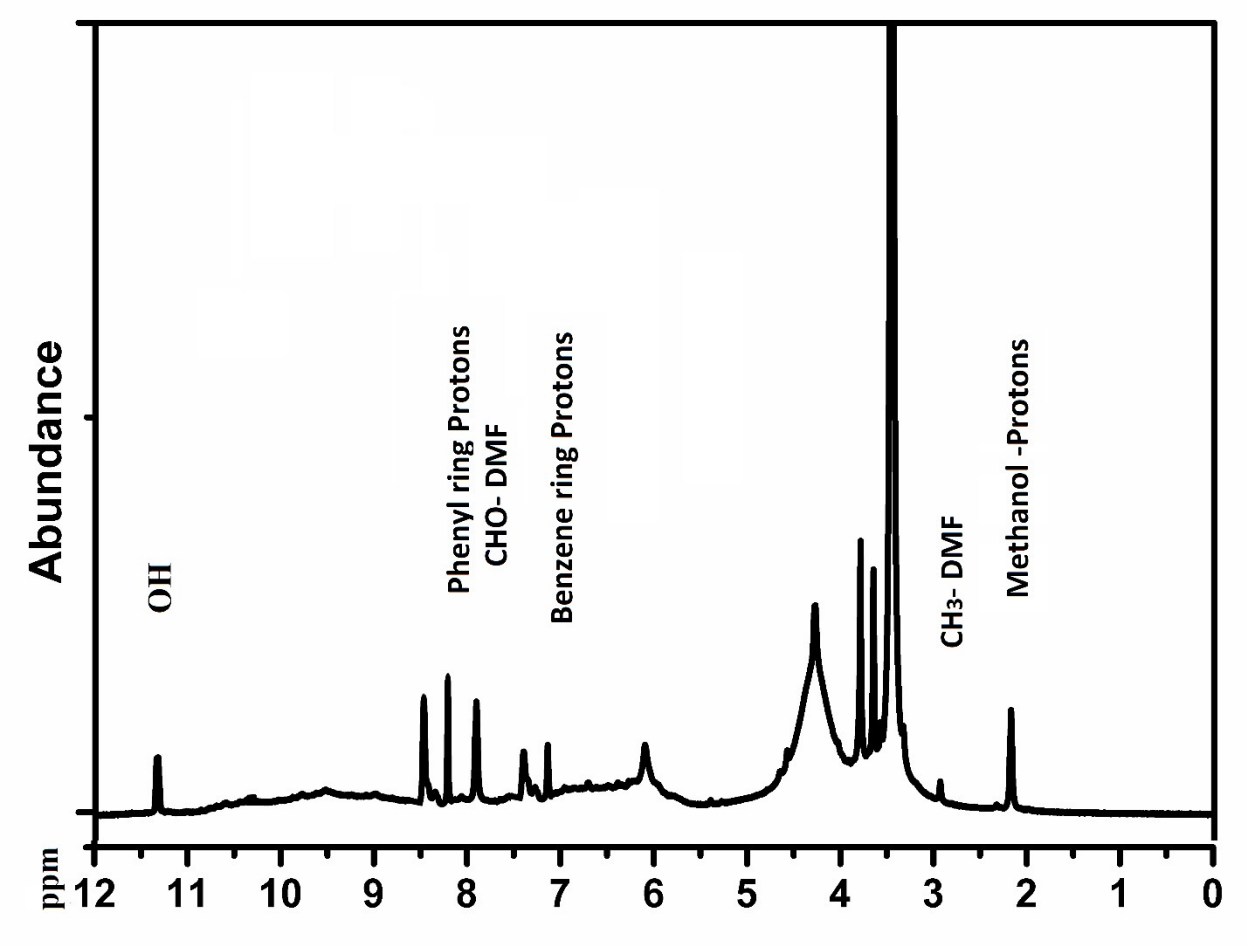


Fig. S4: The ^{1}H-NMR spectrum of Ce(III)-complex **C1**.

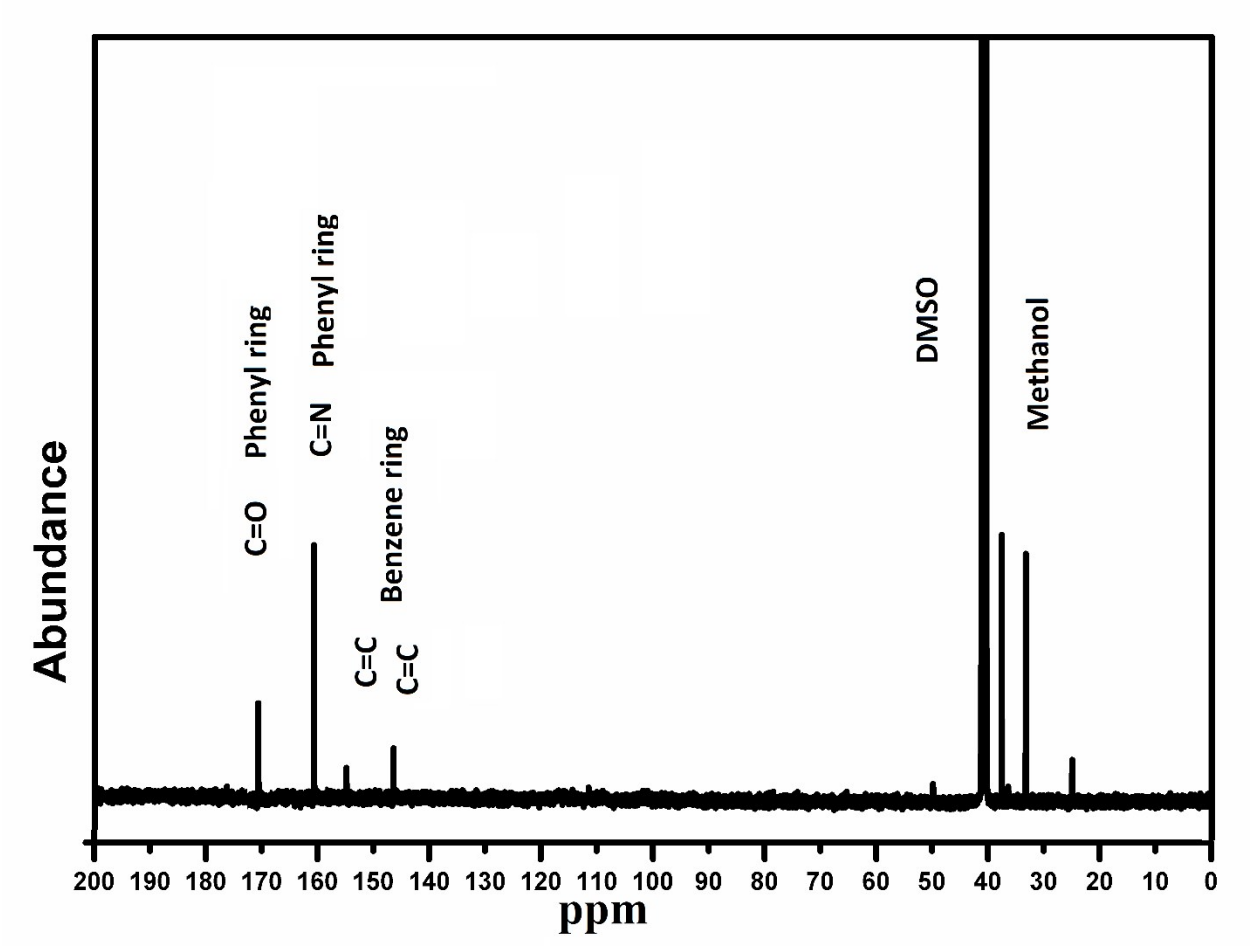


Fig. S5: The ^{13}C-NMR spectrum of Schiff base **L1**.

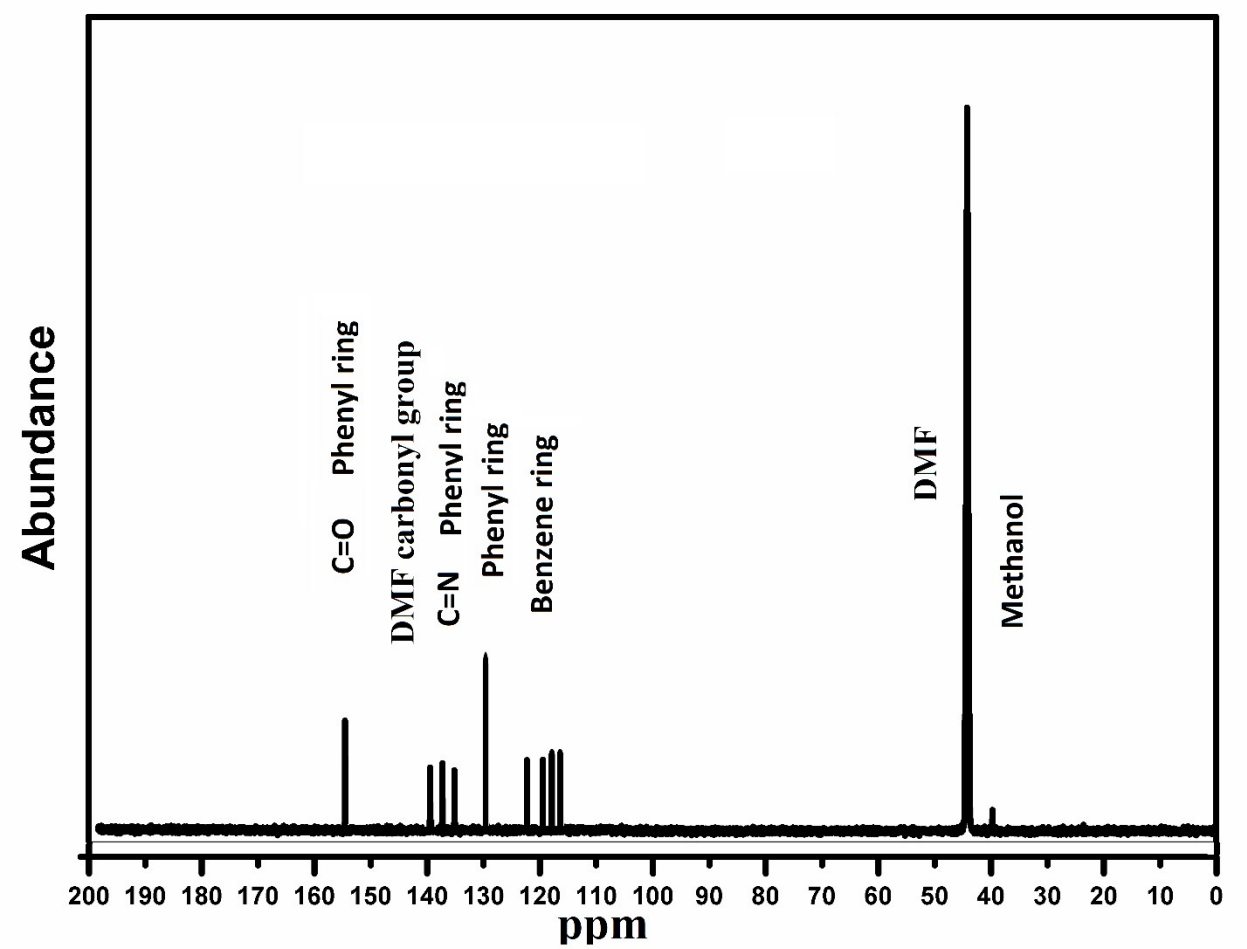


Fig. S6: The ^{13}C-NMR spectrum of Ce(III)-complex **C1**.

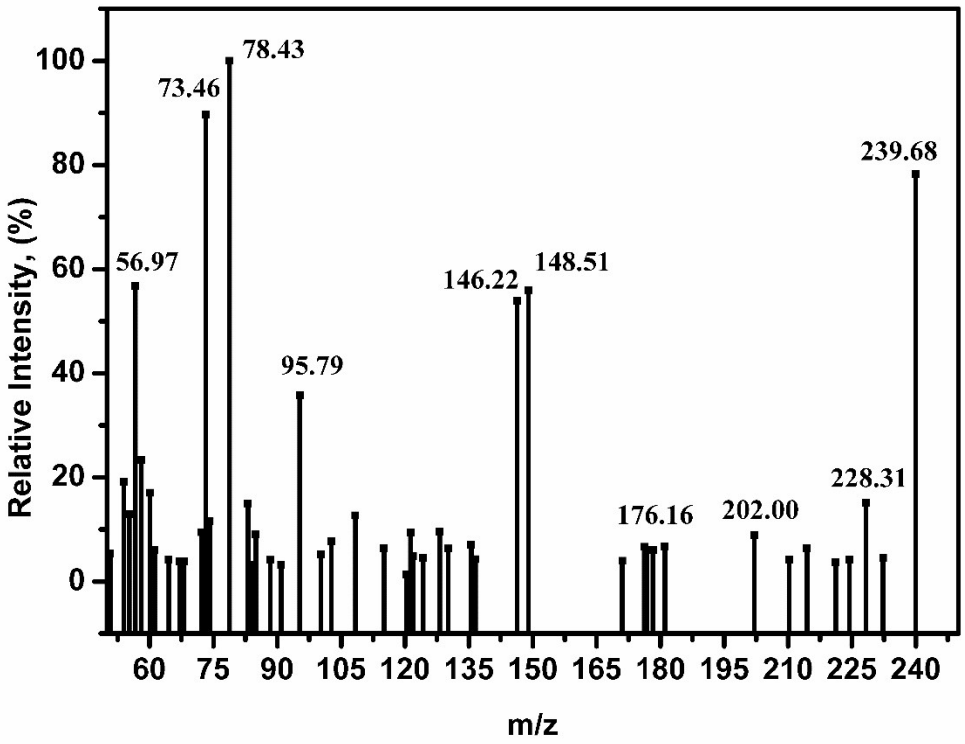


Fig. S7: The mass spectrum of Schiff base **L1**.

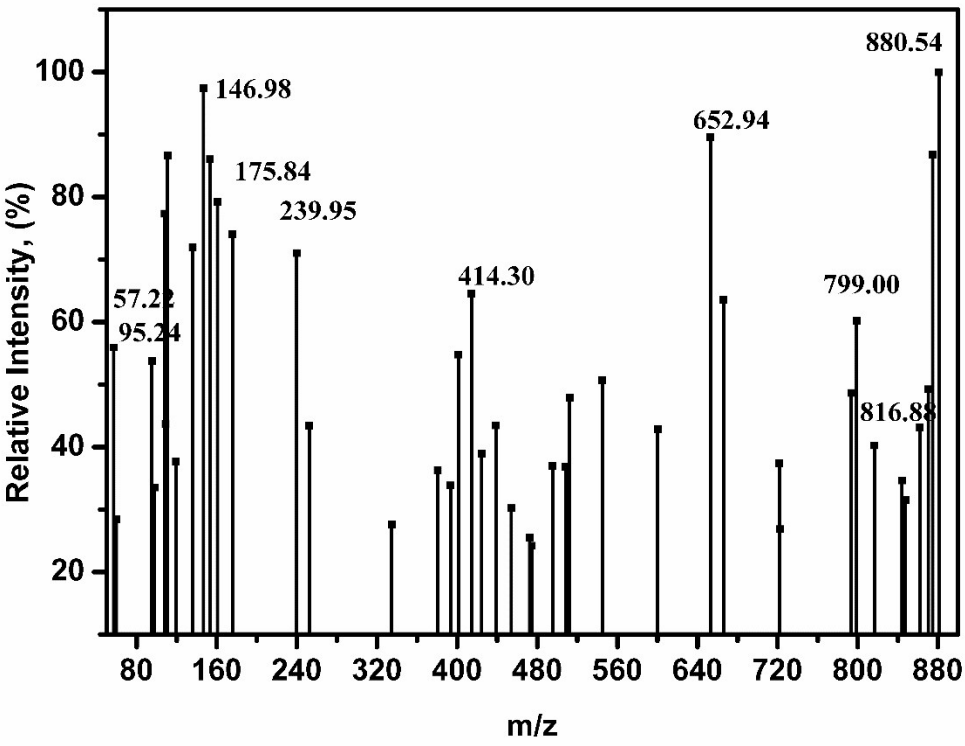


Fig. S8: The mass spectrum of Ce(III)-complex **C1**.

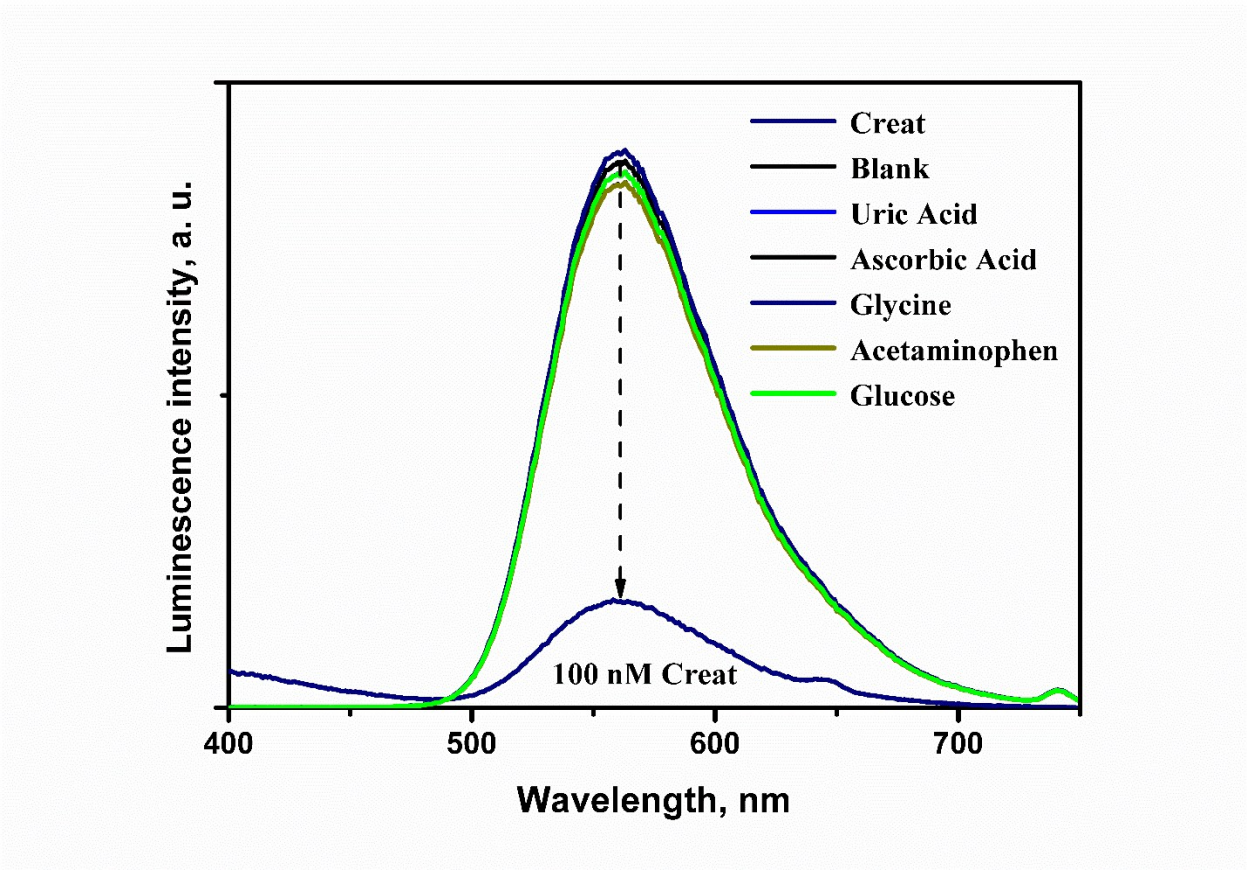


Fig. S9: The PL spectra which represent the effect of different types of interfering analytes on Ce(III)-complex **C1**.

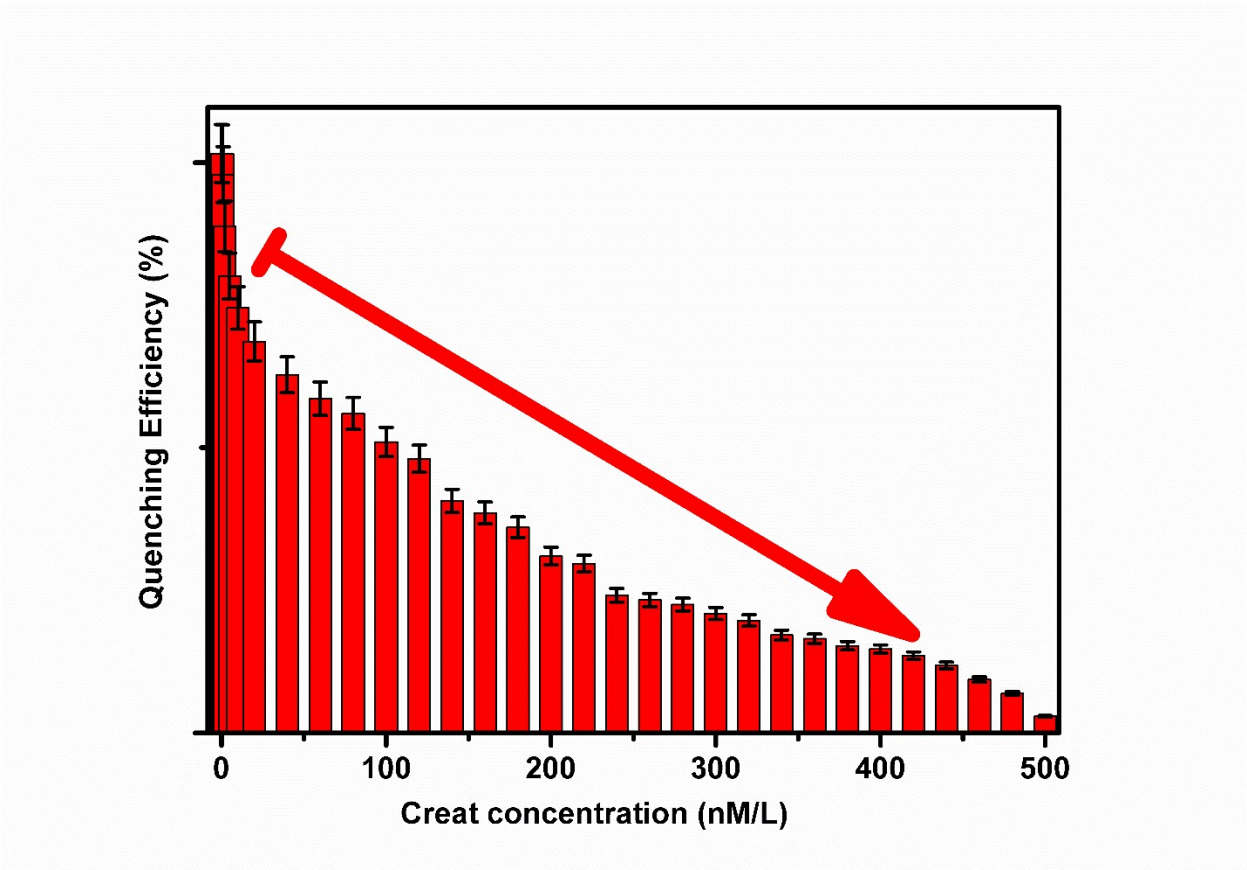
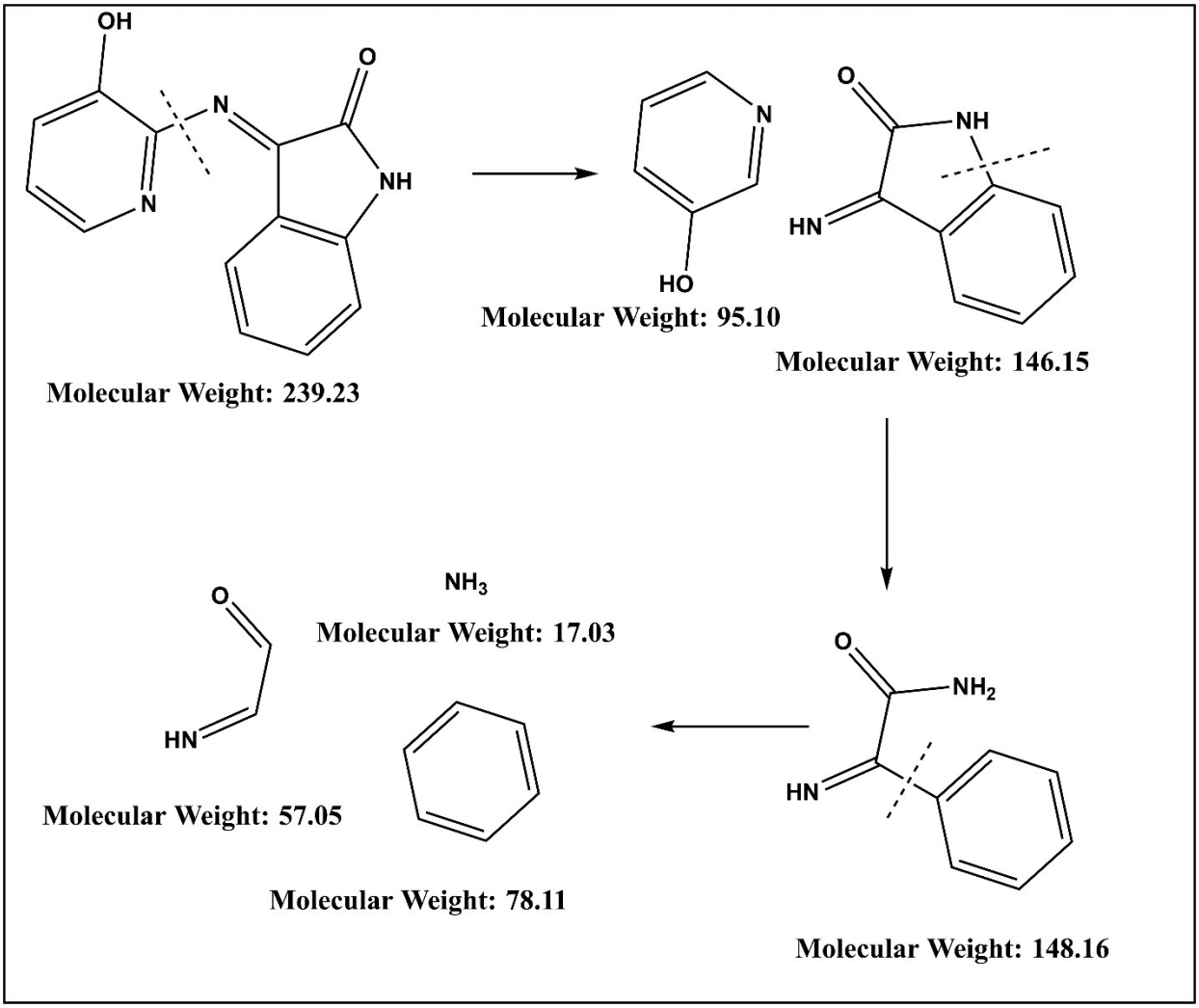
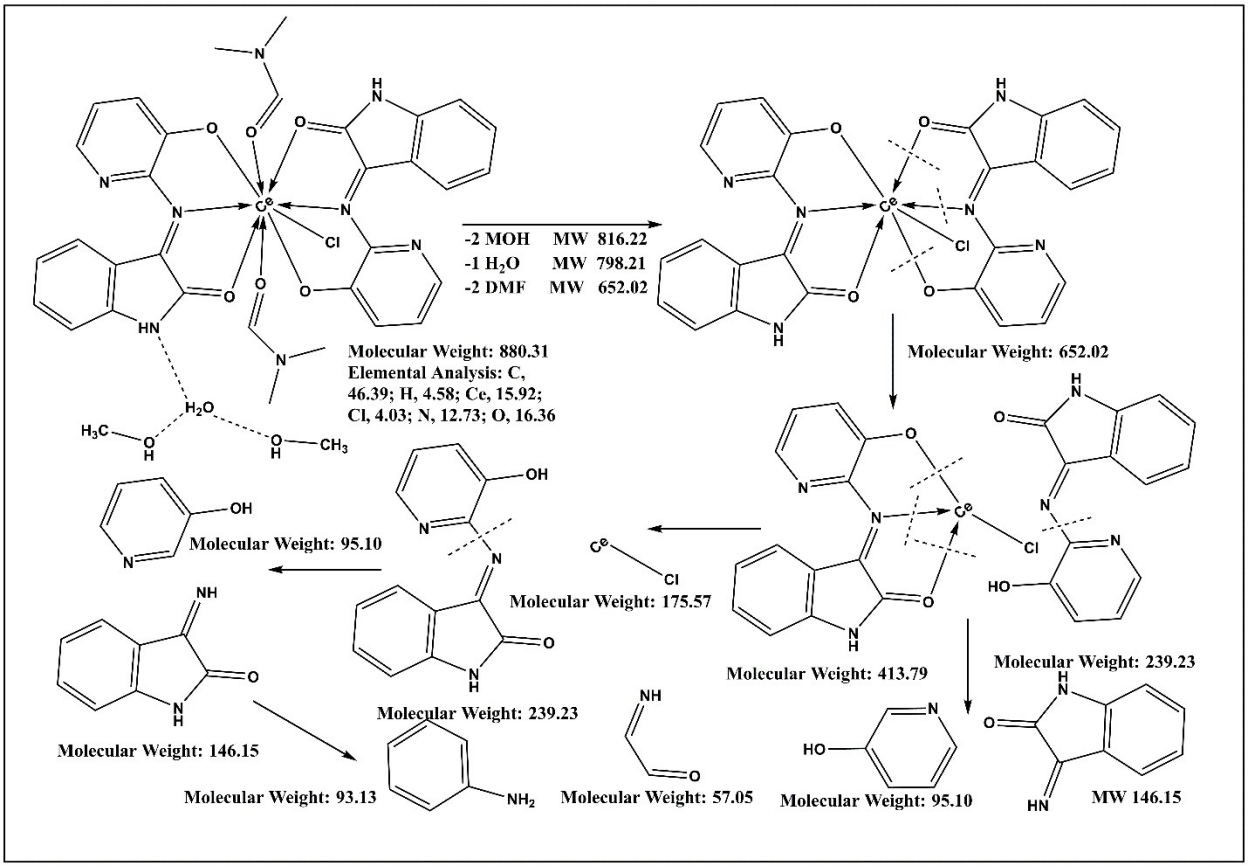


Fig. S10: The PL quenching histogram of **C1** upon incremental addition of different concentrations of creatinine.



Scheme S1: The proposed fragmentation Scheme of Schiff base **L1**.



Scheme S2: The proposed fragmentation Scheme of the Ce(III)-complex **C1**.

Table S1: EDX analysis of Schiff base **L1**.

Element	Theoretically calculated	EDX analysis			
		Weight %	Atomic %	Net Int.	Error %
C	65.27	65.95	69.29	91.92	5.87
N	17.56	17.57	16.36	3.98	25.69
O	17.17	16.48	14.35	13.27	16.5

Table S2: EDX analysis of the Ce(III)-complex **C1**.

Element	Theoretically calculated	EDX analysis			
		Weight %	Atomic %	Net Int.	Error %
C	46.39	47.0	62.71	74.42	8.77
N	12.73	13.68	14.99	4.94	24.11
O	16.36	18.49	17.77	17.47	15.53
Cl	4.03	4.24	2.71	25.04	11.61
Ce	15.92	16.59	1.82	12.45	22.7

Table S3: Some representative bond distances of the optimized structures.

Bond Type	Bond Length (Å)
Ce(53) → N (34)	2.23
Ce(53) → O (33)	2.38
Ce(53) → O (77)	2.22
Ce(53) → O (15)	2.46
Ce(53) → N (8)	2.59
Ce(53) → Cl (78)	1.80
Ce(53) → O (7)	2.42
Ce(53) → O (76)	2.23
Ce(53) → O (41)	1.65

Table S4: Standard orientation of Schiff base **L1**

Center Number	Atomic Number	Atomic Type	Coordinates (Angstroms) X	Y	Z
1	6	0	-3.412681	0.092372	-1.428976
2	6	0	-3.901637	0.765120	-0.311746
3	6	0	-3.242481	0.589497	0.908059
4	6	0	-2.109565	-0.220949	0.964409
5	6	0	-1.683796	-0.839016	-0.230183
6	7	0	-2.338412	-0.705940	-1.391111
7	8	0	-1.420134	-0.356006	2.126726
8	7	0	-0.440089	-1.669019	-0.211878
9	6	0	0.706693	-1.115421	-0.154570
10	6	0	1.118255	0.295385	-0.146456
11	6	0	2.000404	-1.873952	-0.072964
12	6	0	2.517673	0.337383	-0.052545
13	6	0	0.393913	1.486556	-0.243769
14	6	0	3.227639	1.538600	-0.028225
15	8	0	2.161263	-3.090382	-0.055860
16	6	0	1.092079	2.691863	-0.190472
17	7	0	3.030170	-0.966313	-0.009342
18	6	0	2.491153	2.721076	-0.086987
19	1	0	-3.891222	0.207388	-2.418420
20	1	0	-4.775115	1.432619	-0.383295
21	1	0	-3.600185	1.114525	1.810450
22	1	0	-1.832885	0.232293	2.779418
23	1	0	-0.697011	1.494639	-0.375854
24	1	0	4.331385	1.537504	0.028275
25	1	0	0.534756	3.642084	-0.254469
26	1	0	4.046112	-1.205531	0.052355
27	1	0	3.007559	3.693419	-0.072538

Table S5: Standard orientation of the Ce(III)-complex **C1**

Center Number	Atomic Number	Atomic Type	Coordinates (Angstroms) X	Y	Z
1	6	0	-7.123540	-3.200398	-0.042146
2	6	0	-6.435816	-4.178203	0.676533
3	6	0	-5.124721	-3.909666	1.074775
4	6	0	-4.546184	-2.689505	0.733999
5	6	0	-5.330621	-1.744689	0.014155
6	7	0	-6.592219	-2.012610	-0.352231
7	8	0	-3.278062	-2.341935	1.073646
8	7	0	-4.690284	-0.584269	-0.397848
9	6	0	-5.192969	0.591303	-0.454450
10	6	0	-6.437114	1.254822	-0.023897
11	6	0	-4.292782	1.709757	-1.014160
12	6	0	-6.262047	2.642112	-0.255464
13	6	0	-7.630964	0.806318	0.548505
14	6	0	-7.237936	3.572723	0.077614
15	8	0	-3.189021	1.616518	-1.504077
16	6	0	-8.617047	1.734564	0.893154
17	7	0	-5.016057	2.880535	-0.838650
18	6	0	-8.420062	3.099236	0.658822
19	1	0	-8.142948	-3.372858	-0.382195
20	1	0	-6.907956	-5.125657	0.917465
21	1	0	-4.549375	-4.644243	1.636815
22	1	0	-7.794185	-0.253993	0.690954
23	1	0	-7.089807	4.632754	-0.108230
24	1	0	-9.548756	1.390633	1.332453
25	1	0	-4.657341	3.785630	-1.107197
26	1	0	-9.199339	3.808538	0.922757
27	6	0	5.309766	4.010257	0.745133

28	6	0	4.757294	4.492812	1.931507
29	6	0	4.041212	3.606444	2.738511
30	6	0	3.892188	2.283169	2.330636
31	6	0	4.506469	1.875716	1.112919
32	7	0	5.200235	2.735875	0.353665
33	8	0	3.210714	1.351817	3.046509
34	7	0	4.250928	0.579983	0.686152
35	6	0	5.065996	-0.207231	0.091322
36	6	0	6.502408	-0.223774	-0.240304
37	6	0	4.518865	-1.580444	-0.343976
38	6	0	6.785529	-1.508315	-0.768169
39	6	0	7.542030	0.701313	-0.108102
40	6	0	8.067947	-1.880547	-1.150511
41	8	0	3.381593	-1.993039	-0.285858
42	6	0	8.837221	0.335262	-0.483961
43	7	0	5.619101	-2.273394	-0.827664
44	6	0	9.093230	-0.939720	-0.998668
45	1	0	5.865377	4.669556	0.080913
46	1	0	4.878992	5.532795	2.218315
47	1	0	3.591625	3.939543	3.673088
48	1	0	7.331262	1.699364	0.253372
49	1	0	8.268691	-2.868334	-1.555634
50	1	0	9.647216	1.052365	-0.388955
51	1	0	5.555391	-3.220373	-1.172865
52	1	0	10.103233	-1.207179	-1.295995
53	58	0	0.051165	-0.431003	0.303960
54	6	0	-0.449029	-6.038197	-0.378708
55	1	0	-0.789510	-5.634321	0.551806
56	1	0	-1.216623	-5.930697	-1.116368
57	1	0	-0.217082	-7.075265	-0.253844
58	6	0	2.838410	-5.201785	0.461192
59	1	0	3.713899	-4.674484	0.144376

60	1	0	3.071722	-6.238712	0.584679
61	1	0	2.497199	-4.799644	1.392191
62	6	0	0.836605	-2.912962	-1.261113
63	1	0	0.497235	-2.510353	-0.329644
64	6	0	-1.796942	5.070533	-2.484668
65	1	0	-2.673072	4.544842	-2.166950
66	1	0	-1.455341	4.665376	-3.414214
67	1	0	-2.029365	6.107267	-2.611399
68	6	0	1.490507	5.906910	-1.644778
69	1	0	2.257406	5.801159	-0.906142
70	1	0	1.259407	6.943749	-1.773064
71	1	0	1.831481	5.499897	-2.573744
72	6	0	0.199084	2.785023	-0.751292
73	1	0	0.541619	2.378539	-1.679915
74	7	0	1.303232	-4.986815	-1.014144
75	7	0	-0.263036	4.858758	-1.007547
76	8	0	2.006009	-2.208691	-1.687018
77	8	0	-0.973248	2.084218	-0.327725
78	17	0	-0.698691	-2.466606	0.115590

Table S6: Sensitivity and regression parameters for the Ce-complex optical sensor.

Parameter	Value
Emission wavelength (nm)	560
Linear range (nM)	2.5-480
Limit of detection (nM)	1.07
Limit of quantitation (nM)	3.25
Regression equation	$y = a + bx^*$
Intercept (a)	0.31619
Slope (b)	0.01549
Standard deviation	0.00504
Correlation coefficient (r^2)	0.989

*$^*y$, is the PL intensity of **C1**; x, is the concentration in creatinine in nan-mole/liter (nM/L); a, is the intercept; and b, is the slope.*

Table S7: Evaluation of intra-day and inter-day accuracy and precision.

Creatinine concentration (Standard) (nM)	Intra-day precision				Inter-day precision			
	X	SD	CV	RE%	X	SD	CV	RE%
5.0	5.033	0.208	0.043	0.993	4.831	0.235	0.055	1.035
50.0	48.67	0.52	0.271	1.027	49.22	1.614	2.605	1.016
100.0	99.5	1.796	3.227	1.005	99.18	3.253	3.582	1.008
250.0	241.3	2.165	4.688	1.036	251.7	2.41	1.831	0.993

X, mean values; SD, standard deviation; CV, the coefficient of variation; RE %, relative error percent.

Table S8: Results of recovery study using spiking technique**.**

Sample	Standard creatinine added, (nM)*	Amount of creatinine found, (nM)*			Average amount of creatinine found, (nM)*	creatinine recovery, (Percent ± SD)
Serum samples	50.0	51	48.5	52.5	50.67	101.3 ± 2.02
	100.0	96	97.5	98.75	97.42	97.42 ± 1.34
	200.0	196.5	197.15	196.41	196.7	98.34 ± 0.40
Plasma samples	50.0	49.125	49.29	49.19	49.17	98.34 ± 0.10
	100.0	101.59	96.74	97.13	98.49	98.49 ± 2.70
	200.0	191.72	196.9	196.7	195.1	97.55 ± 2.94

* Each reading was repeated three times

Table S9: Stern-Völmer quenching constants and correlation coefficient for interaction between **C1** and creatinine at various temperature

T (K)	K_{sv} (X 10^{-3} dm^3/mol)	Correlation coefficient, r^2
298	0.01549	0.9892
300	0.02062	0.9692
303	0.0332	0.9873
308	0.04861	0.9781