Supplementary file

Green, near infrared electroluminescence of novel tetrazole Yttrium complexes

**Hashem Shahroosvand, Leyla najafi , Ezeddin Mohajerani, AmirKhabbazi, Mahmoud Nasrollahzadeh**

S1.

CHN and ICP analysis were carried out to determine the presence of ligands and metal in the complexes. CHN analyses of compounds were obtained: Anal. Calc. for (1) , $(C_{45}H_{33}N_{16}OY)$: C, 59.870; H, 3.684; N, 24.824. Found: C, 59.787; H, 3.612; N, 24.701%. Anal. Calc. for (2) , $(C_{41}H_{33}N_{16}OY)$: C, 57.615; H, 3.891; N, 26.219. Found: C, 57.550; H, 3.812; N, 26.168% . Anal. Calc. for (3) , $(C_{39}H_{28}N_{13}OSY)$: C, 57.425; H, 3.459; N, 22.322. Found: C, 57.389; H, 3.411 N, 22.275% . Anal. Calc. for (4) , $(C_{35}H_{28}N_{13}OSY)$: C, 54.761; H, 3.676; N, 23.719. Found: C, 54.701; H, 3.598; N, 23.650%. Y was analyzed on a PLASMA-SPEC (I) ICP atomic emission spectrometer. A few mg of complexes (0.02g) were destroyed in HNO_3 (68%) and finally diluted in water to 1:10 for being measured. The found concentrations for all complexes were estimated about 2.5-3 ppm.

S2: The current density (J) and luminance (L) at different applied voltage (V) characteristics of samples (1-4).

a : (mA/cm^2), b : (cd/m^2), J: Current density, L: Luminance

| V(V)	(1)		(2)		(3)		(4)	
	J	L^b	J^a	L^b	J^a	L^b	J^a	L^b
1		0	--	0	--	0	7.91E-3	0
2	1.62796	0	--	0	1.46E-08	0	55.2E-3	0
3	3.54667	0	1.40333	0	0.00545	0	88.21E-3	0
4	6.03397	0	2.83333	0	0.17092	0	1.021	0
5	9.08985	0	3.95667	0	1.14	0	2.35	0
6	12.71432	0.833	5.85667	0.833	1.664	0.833	2.987	0.8333
7	16.54114	6.664	8.214	5.831	3.366	5.831	3.257	2.4999
8	20.36784	9.996	12.0025	3.332	5.236	3.332	5.324	4.9998
9	26.40121	14.994	17.74667	9.996	8.572	9.996	8.214	5.8331
10	35.16122	22.491	23.38	14.161	14.074	10.829	12.358	9.9996
11	48.65513	34.153	31.19333	21.658	20.25	15.827	16.325	13.3328
12	66.68737	48.314	44.41667	31.654	30.27	24.99	19.258	15.8327
13	86.65416	68.306	64.19333	49.98	40.488	33.32	22.358	19.1659
14	114.7008	91.63	83.52667	65.807	51.088	43.316	27.258	22.4991
15	150.739	123.284	109.86	89.964	66.194	56.644	35.329	30.8321
16	193.4462	160.769	137.7633	114.121	79.196	72.471	41.001	37.4985
17	242.8222	203.252	176.67	147.441	107.134	92.463	52.001	44.9982
18	298.8672	249.9	233.3367	198.254	139.02	122.451	59.254	51.6646
19			270.5133	228.242	162.129	142.443	70.142	62.4975

S3: The current density (J) versus applied voltages (V) characteristics of devices (1-4).
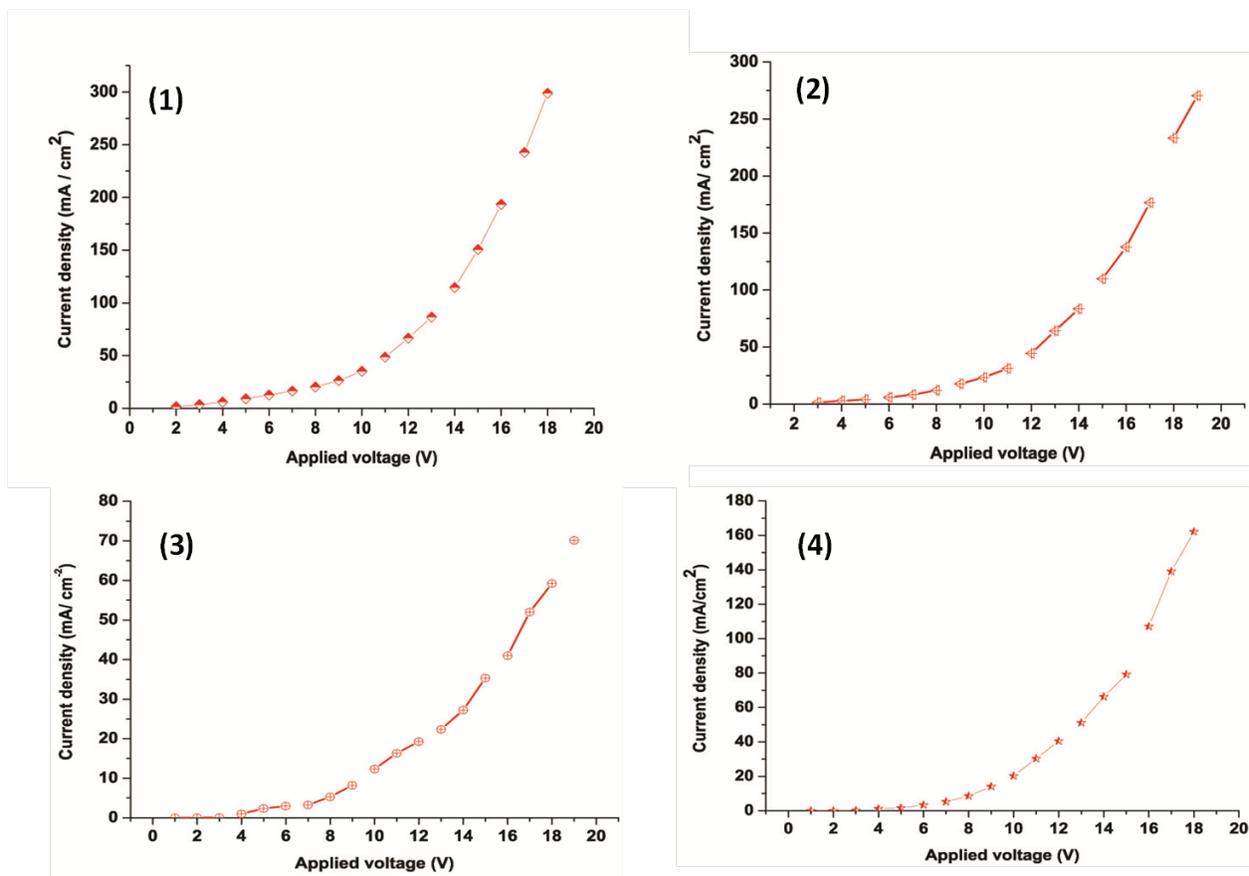
S4: The luminance (L) versus applied voltages (V) characteristics of samples (1-4)
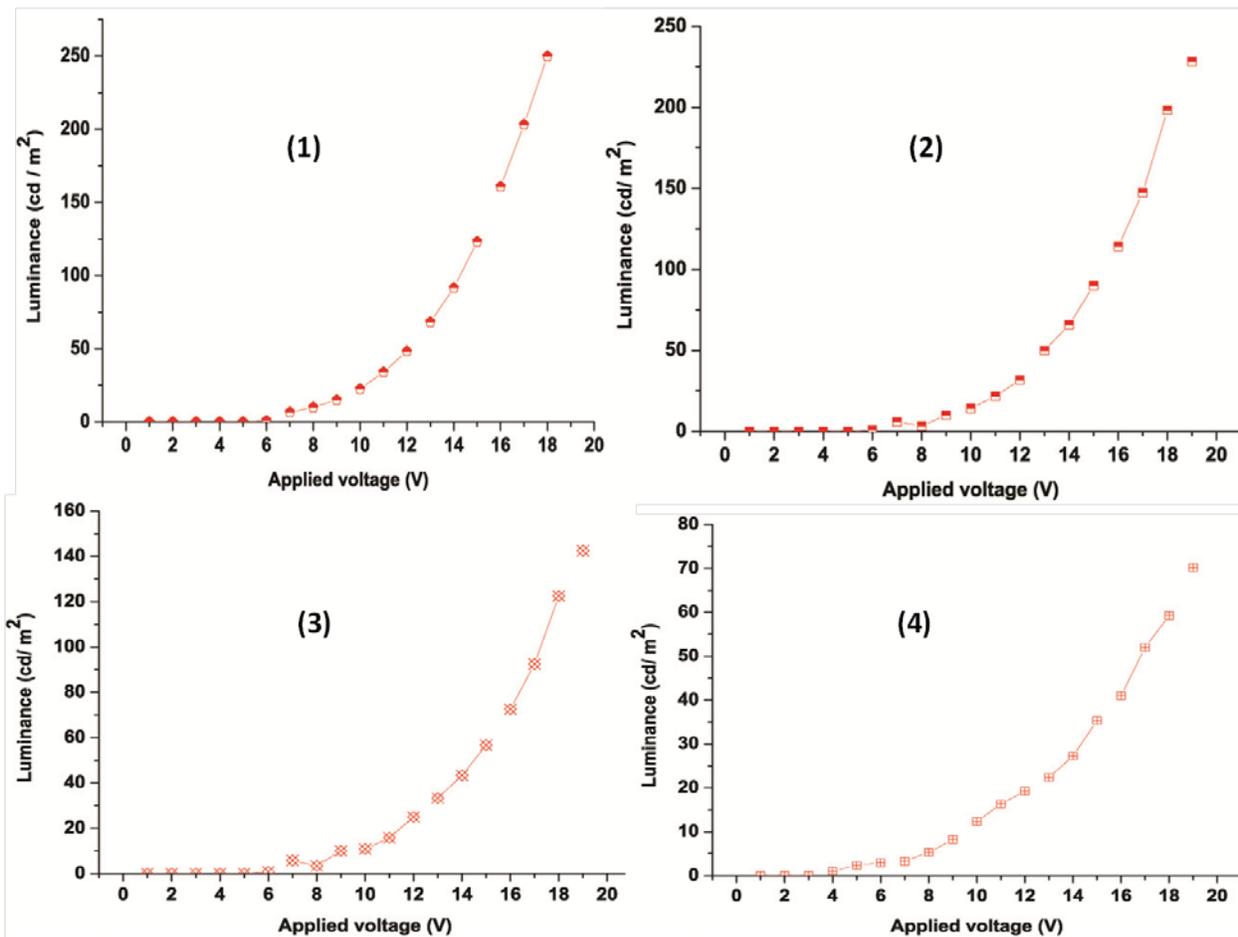
S5: The maximum efficiency(LE) versus applied voltages (V) characteristics of devices (1-4).
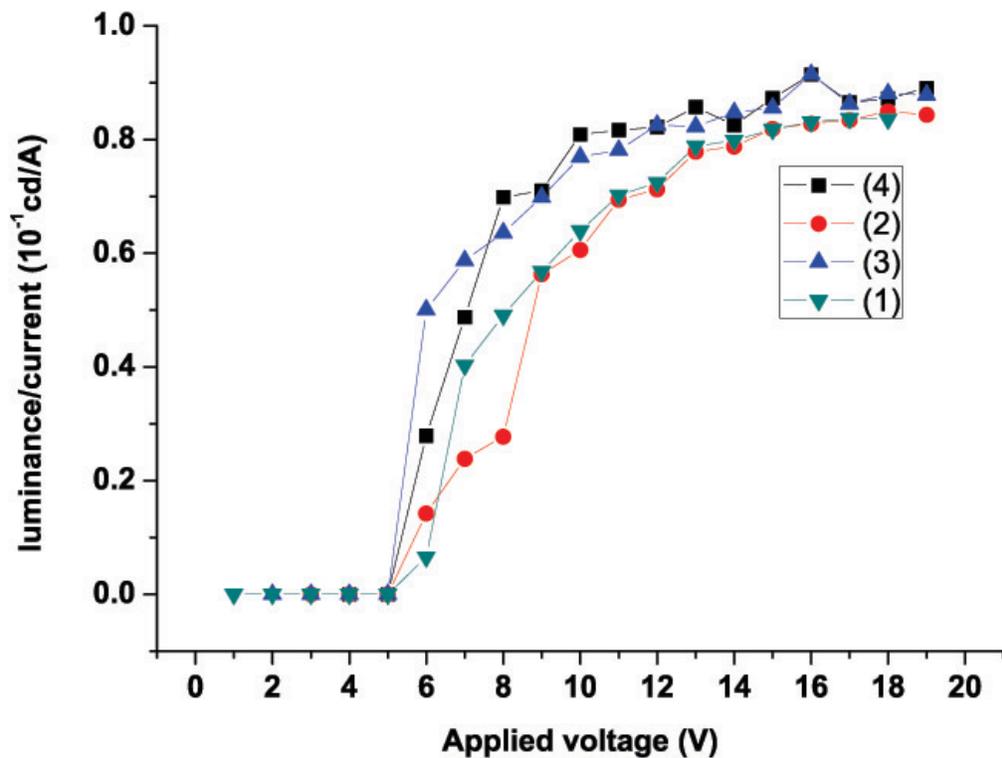
S6: The color coordinates in the Commission Internationale del'Eclairage (CIE 1931) chromaticity chart and the full width at half-maximum (FWHM) and the correlated color temperature (CCT).

No.	(x,)	(Y)	FWHM (nm)	CCT (K)	Turn on (V)
(1)	0.409,	0.402	180	3502	6
(2)	0.410	0.403	186	3502	6
(3)	0.352	0.380	236	4830	9
(4)	0.367	0.391	239	4845	10

S7: Near Infra Red El spectra of device (1) at different applied voltages.