Supporting Information

A new kind of peripheral carbazole substituted ruthenium(II) complexes for electrochemical deposition organic light-emitting diodes

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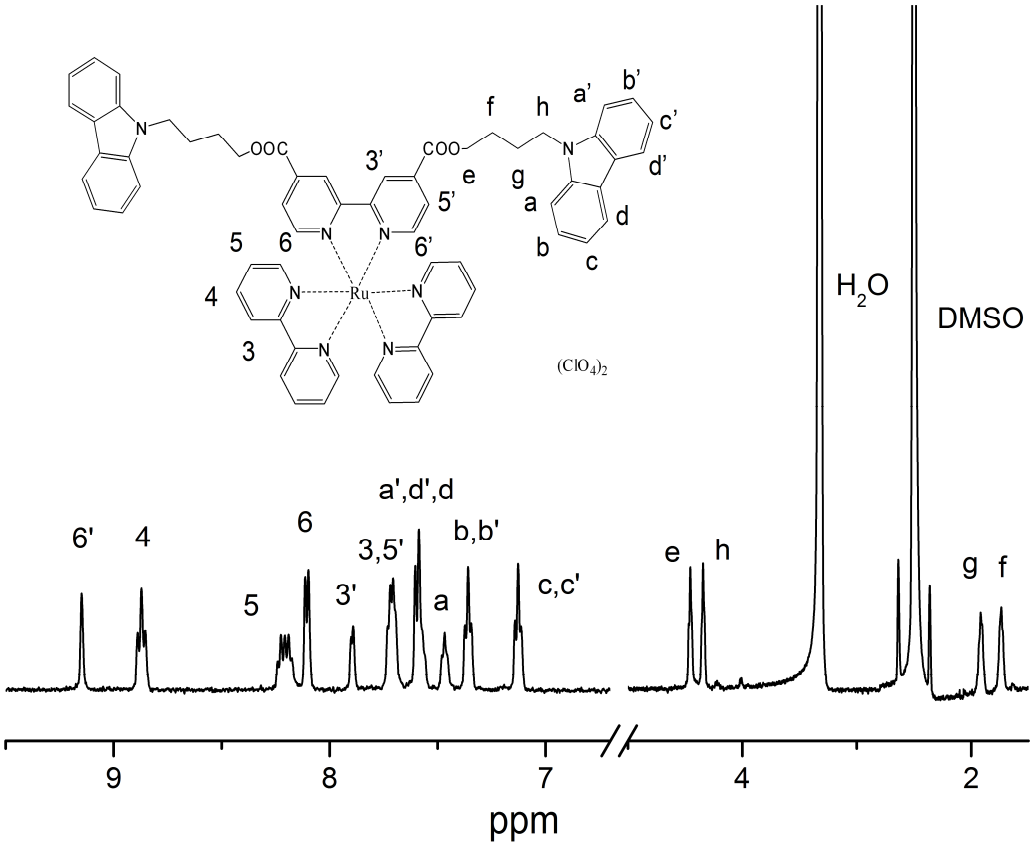

Fig. S1. ^{1}H NMR spectrum of complex $Ru(bpy)_2(dkte\text{-}bpy)(ClO_4)_2$ in the $CDCl_3$ solution.

Fig. S1 shows the ^{1}H NMR and spectrum of $Ru(bpy)_2(dkte\text{-}bpy)(ClO_4)_2$. All of the aromatic peaks corresponding to the bipyridine ligands as well as the carbazole groups are observed in the high-frequency region higher than 7 ppm along with the aliphatic peaks from the butyl moieties in the low-frequency region from 1 ppm to 5 ppm.

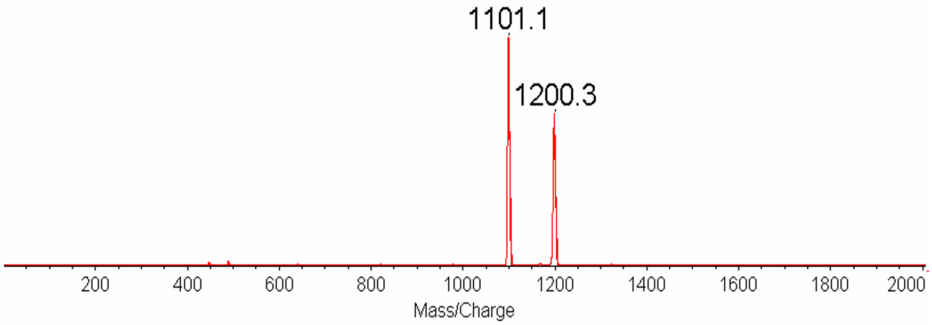

Fig. S2. MALDI-TOF-MS spectrum of $Ru(bpy)_2(dkte\text{-}bpy)(ClO_4)_2$.

Fig. S2 shows the MALDI-TOF-MS spectrum of $Ru(bpy)_2(dkte\text{-}bpy)(ClO_4)_2$. It clearly depicts molecular weight of 1101.1 and 1200.3 corresponding to the characteristic $[M - ClO_4^- + H]^+$ and $[M - 2ClO_4^- + H]^{2+}$ of this complex also in agreement with calculated molecular weight of 1100.2 and 1199.7, respectively.

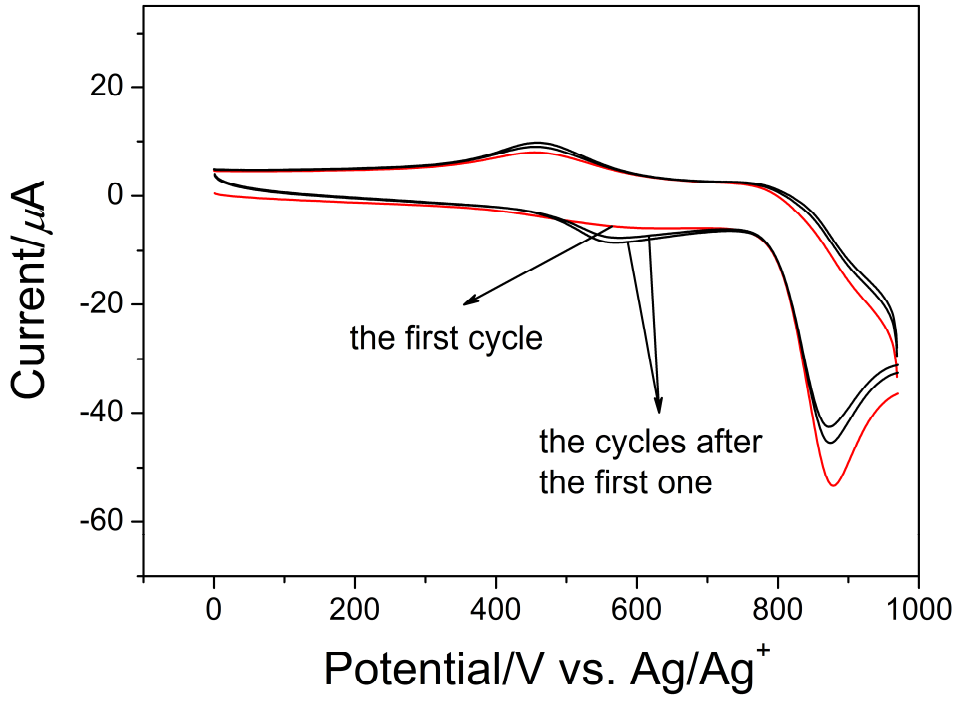

Fig. S3. Electrochemistry polymerization curves of $Ru(bpy)_2(dkte\text{-}bpy)(ClO_4)_2$ in acetonitrile solution.

Fig. S3 shows the electrochemistry polymerization curves of complex $Ru(bpy)_2(dkte\text{-}bpy)(ClO_4)_2$ in acetonitrile solution from 0 to 0.97 V. The complex shows only one signal at 0.48 V in the first cycle, which is attributed to the reduction of dimeric carbazoles. While repetitive CV scans between chosen potential limits continuous, both signals of oxidation and reduction of dimeric carbazoles appear at 0.48 and 0.50 V, respectively, and the reversible couples turn lower in potential gradually but become more prominent with each scan.

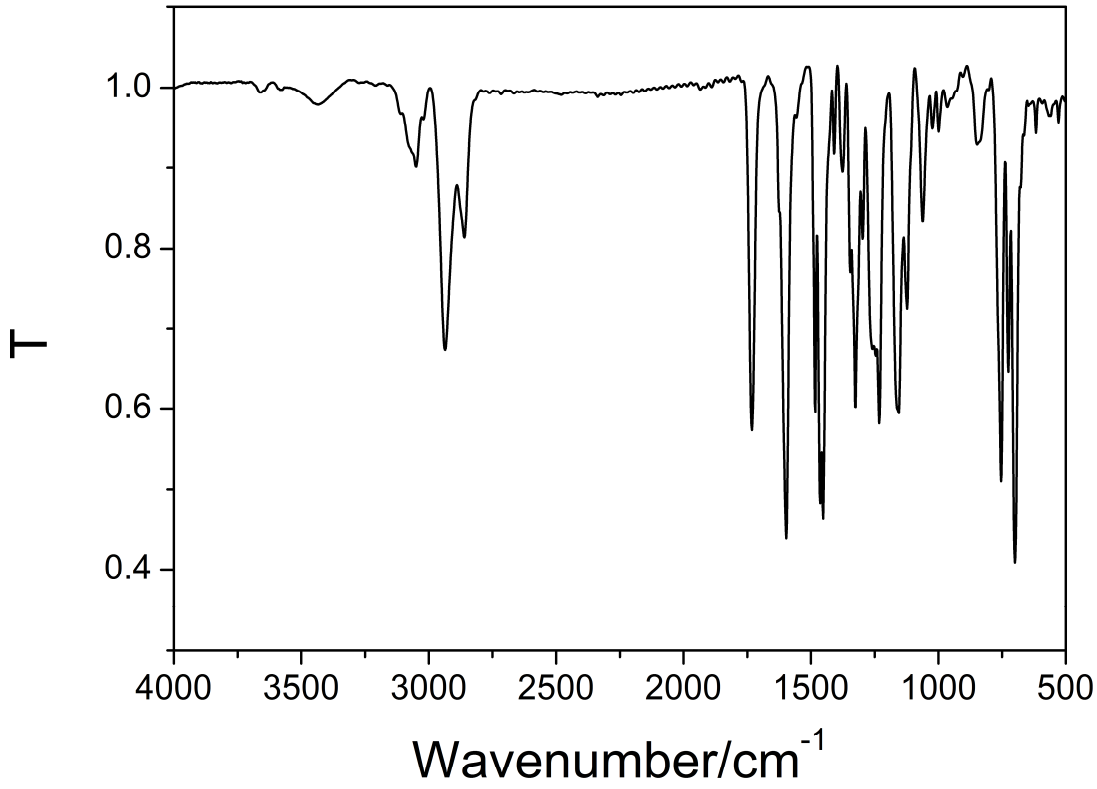

Fig. S4. IR spectrum of complex $Ru(bpy)_2(tkdp\text{-}bpy)(AsF_6)_2$.

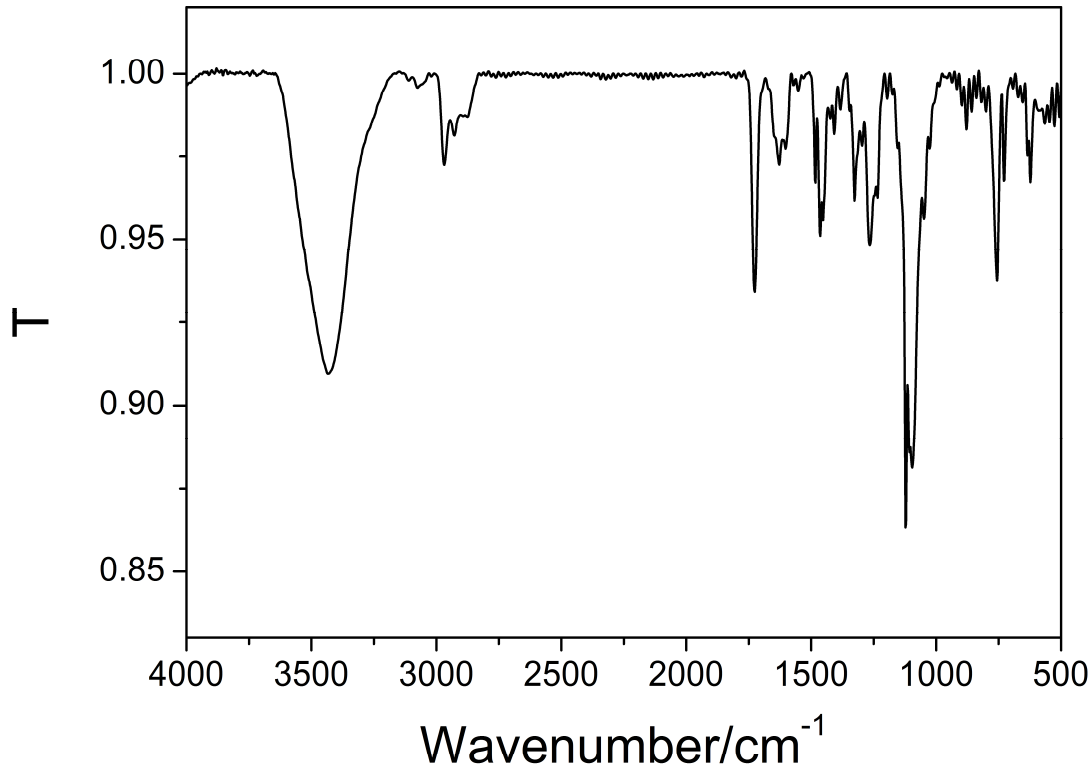

Fig. S5. IR spectrum of complex $Ru(bpy)_2(dkte\text{-}bpy)(ClO_4)_2$.

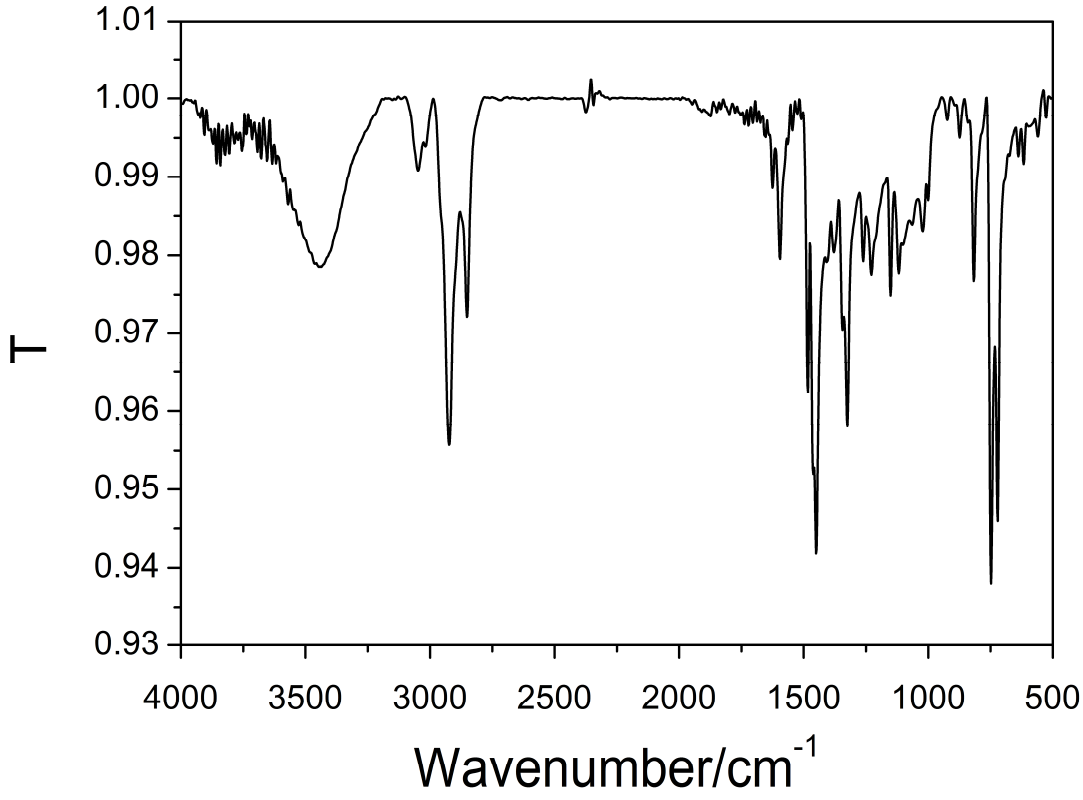

Fig. S6. IR spectrum of compound TCPC-6.

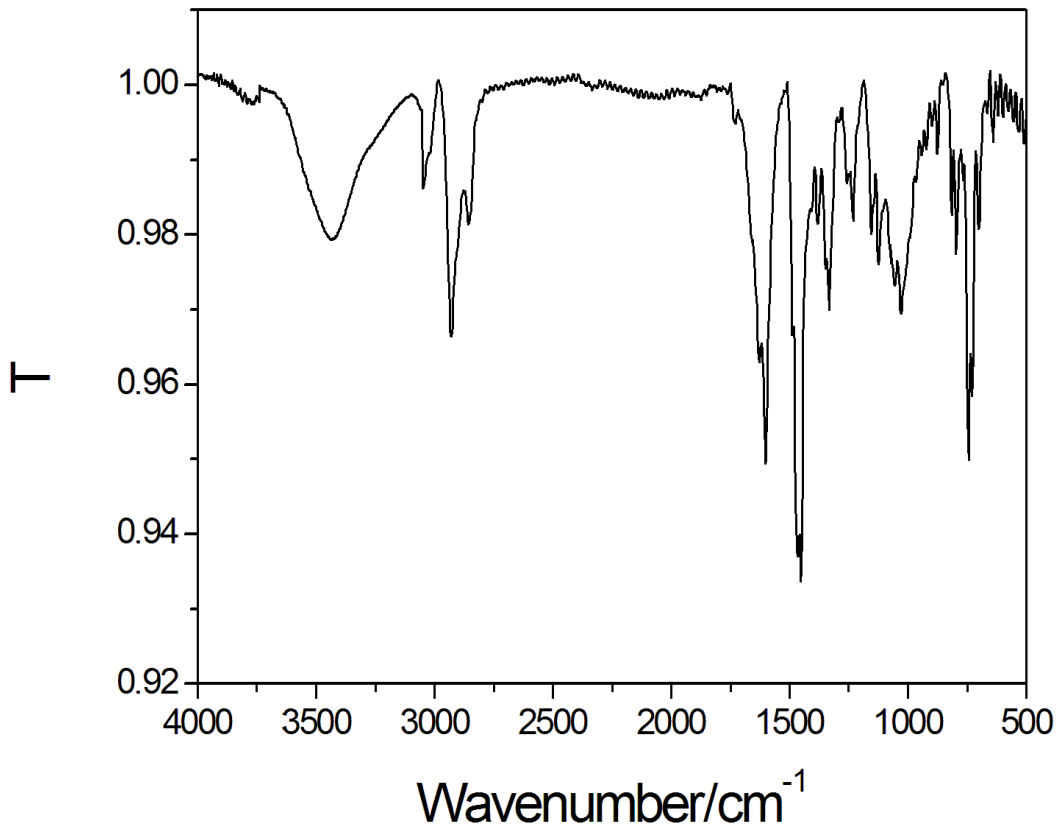

Fig. S7. IR spectrum of ED film with TCPC-6 and $Ru(bpy)_2(tkdp\text{-}bpy)(AsF_6)_2$.