Electronic Supplementary Material (ESI) for Dalton Transactions.
This journal is © The Royal Society of Chemistry 2020

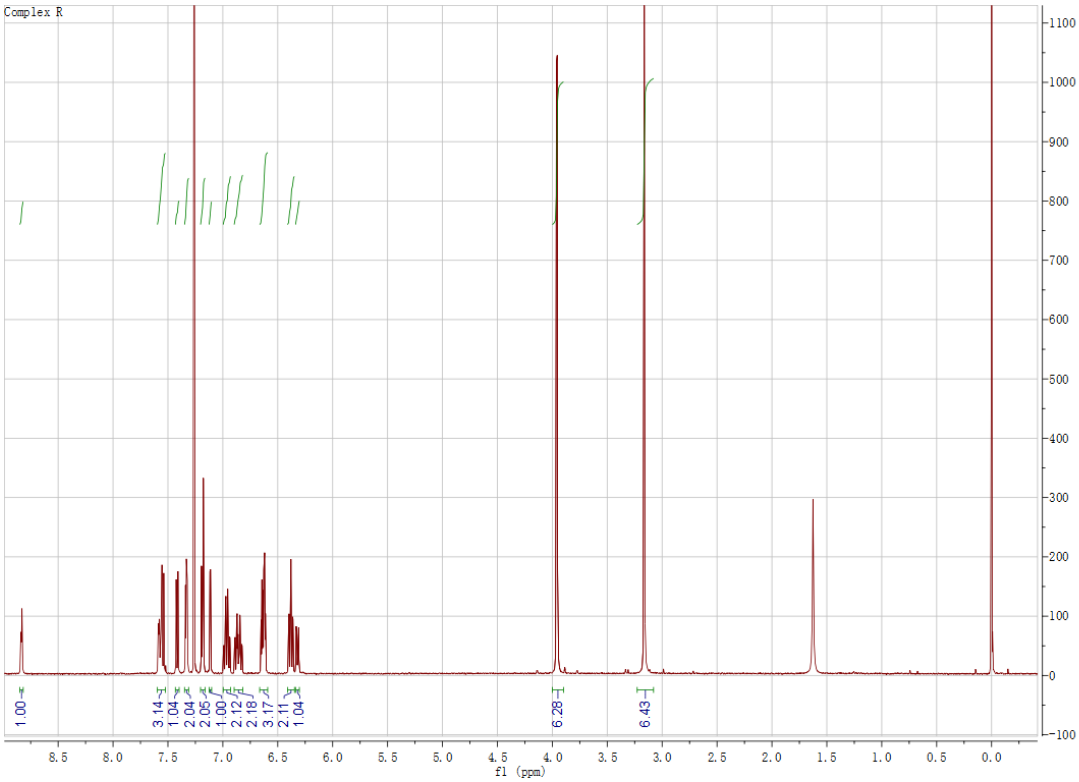
Electronic Supplementary information

Sky-blue-emitting Cationic Iridium Complexes with Carbazole-type Counter-anions and Their Use for Efficient Solution-processed Organic Light-emitting Diodes

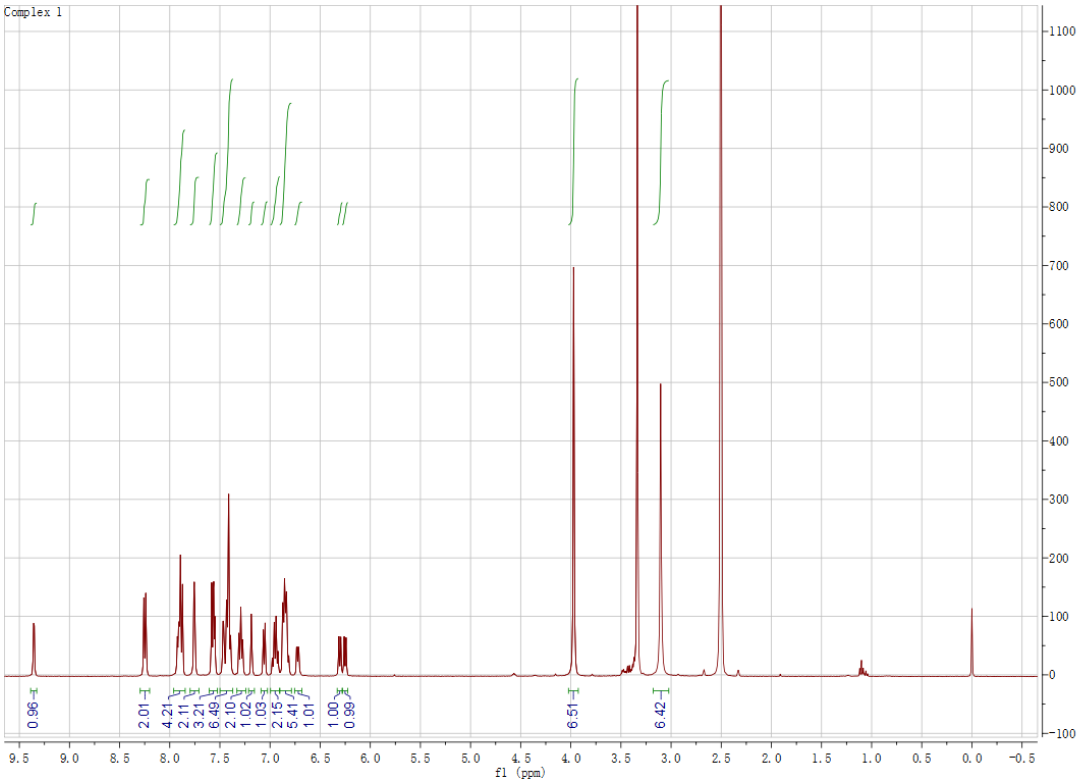
*Renyou Yu, Pei Wang, Xianwen Meng, Lei He**

College of Chemistry, Key Laboratory of Pesticide and Chemical Biology of Ministry of Education, Hubei International Scientific and Technological Cooperation Base of Pesticide and Green Synthesis, Central China Normal University, Wuhan 430079, People's Republic of China.

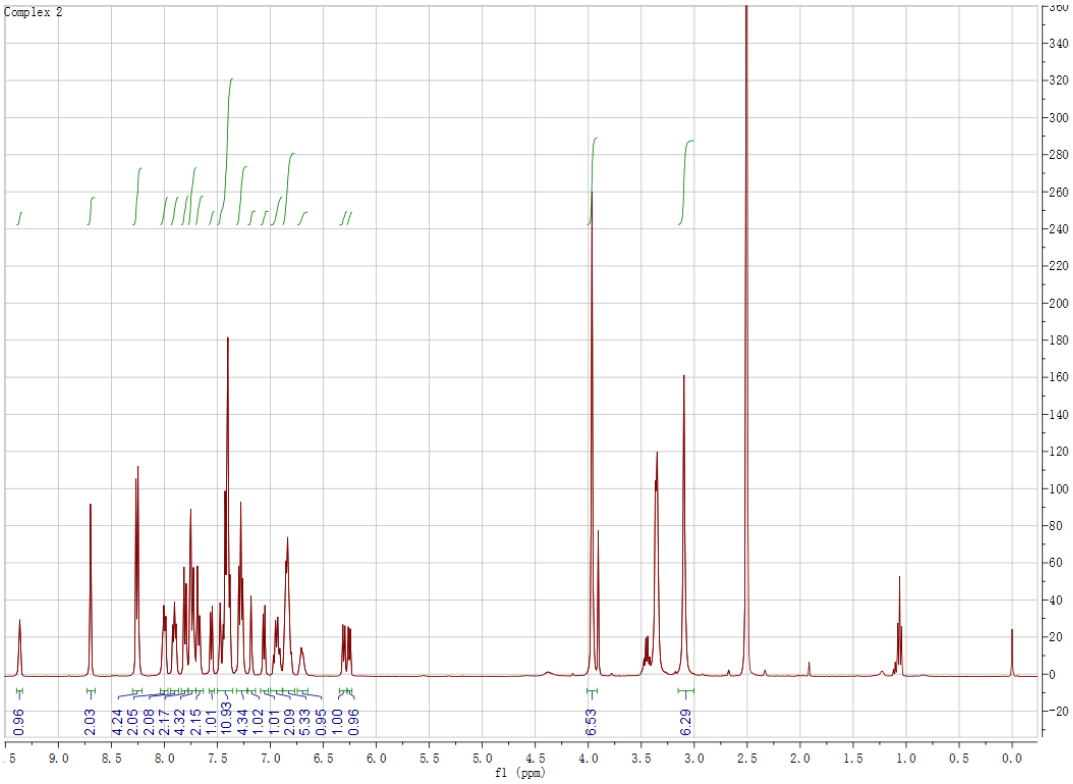
E-mail: helei@mail.ccnu.edu.cn



Scheme S1. ^{1}H NMR of complex R in $CDCl_3$.



Scheme S2. ^{1}H NMR of complex 1 in DMSO-d_6.



Scheme S3. ^{1}H NMR of complex 2 in DMSO-d_6.

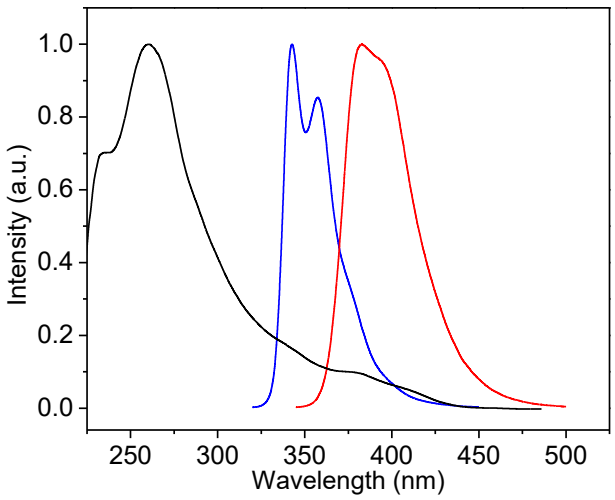


Figure S1. Overlap between the PL spectra of CAZ-SO_3Na (blue line) and TCAZ-SO_3Na (red line) and the absorption spectrum of $[Ir(meoppy)_2(dmapzpy)]^+$ (black line).

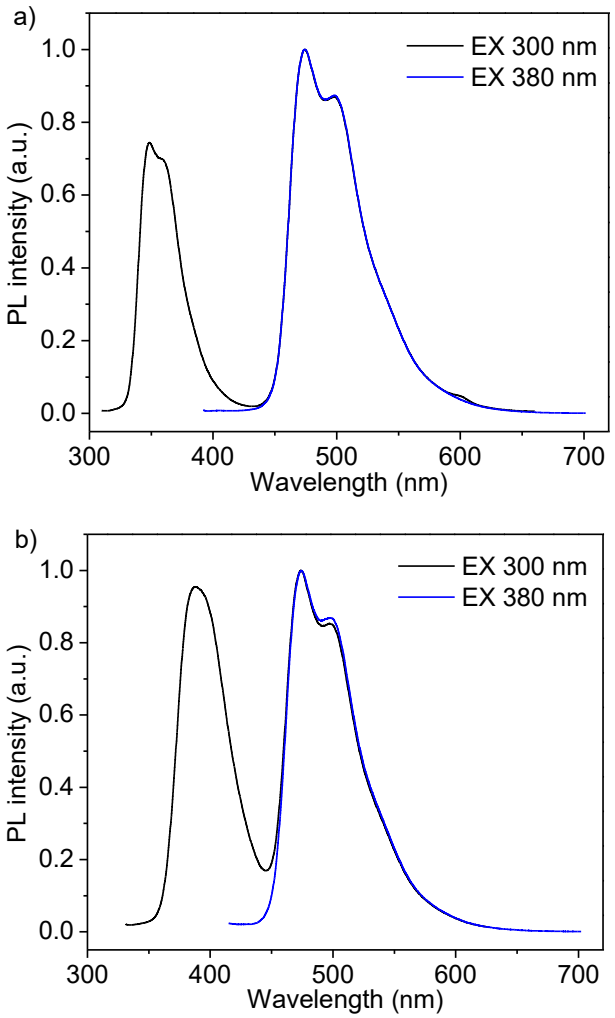


Figure S2. PL spectra of a) complex 1 and b) complex 2 in degassed CH_3CN solution under different excitation wavelengths.

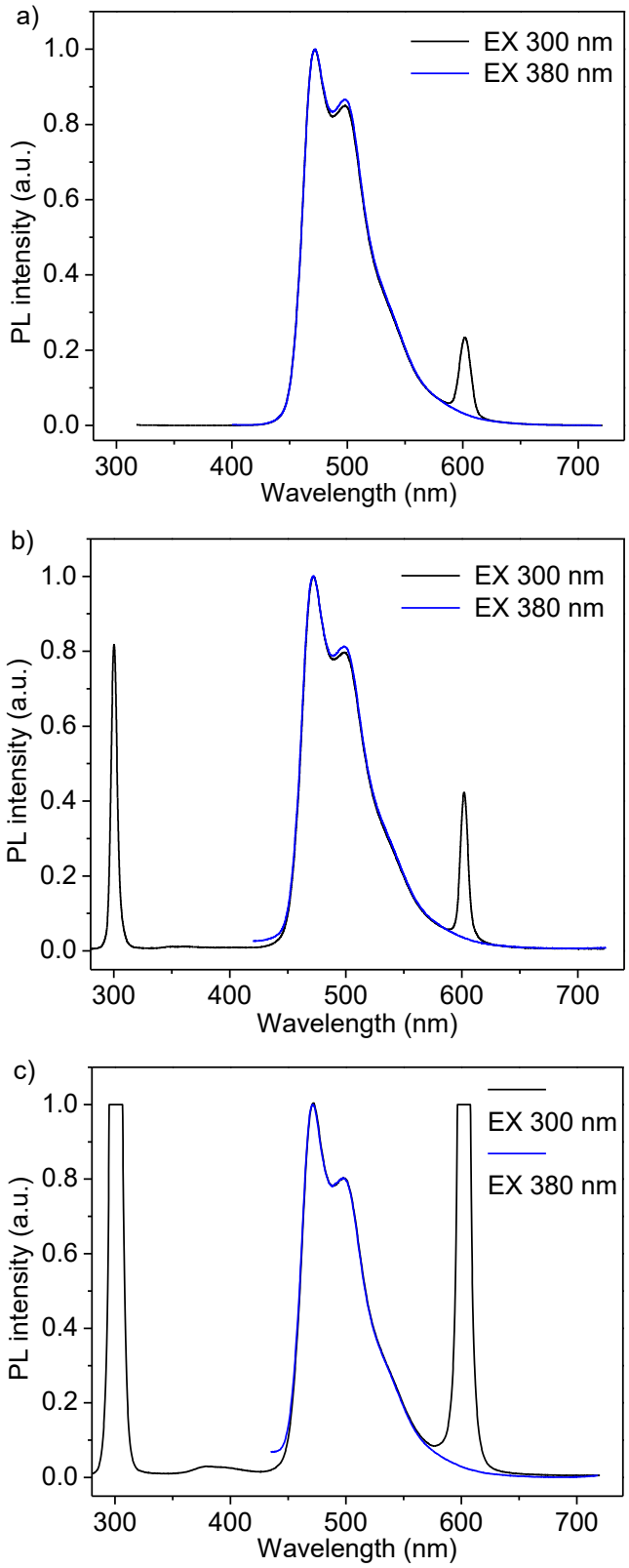
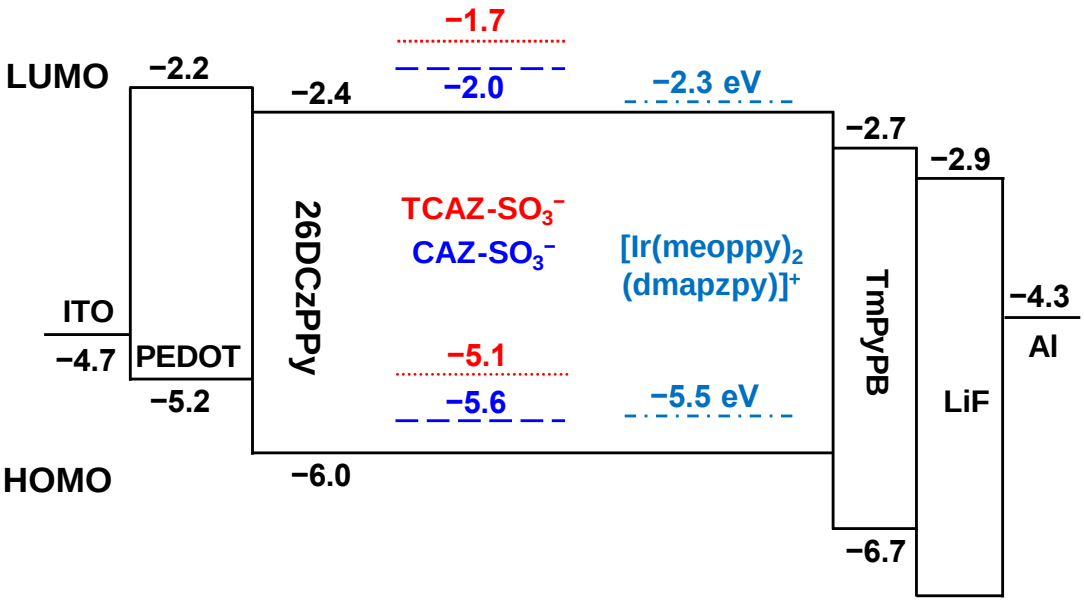


Figure S3. PL spectra of a) complex R, b) complex 1 and c) complex 2 in 2 wt.% doped PMMA films under different excitation wavelengths. The sharp peaks at 300 and 600 nm originate from the light source of fluorospectrometer.



Scheme S4. Energy level (in eV) diagrams for the OLEDs using complexes R and 1-2. The HOMO levels of the anions were calculated from the onsets of oxidation potentials and the LUMO levels were then calculated on the basis of HOMO levels and optical band gaps. The HOMO and LUMO levels of $[Ir(meoppy)_2(dmapzpy)]PF_6$ were calculated from the onsets of oxidation and reduction potentials, respectively.

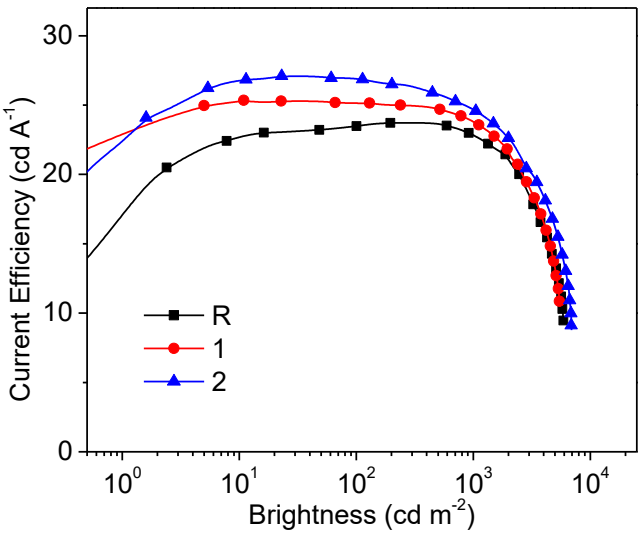


Figure S4. Current-efficiency versus brightness curves for OLEDs based on complexes R and 1-2.

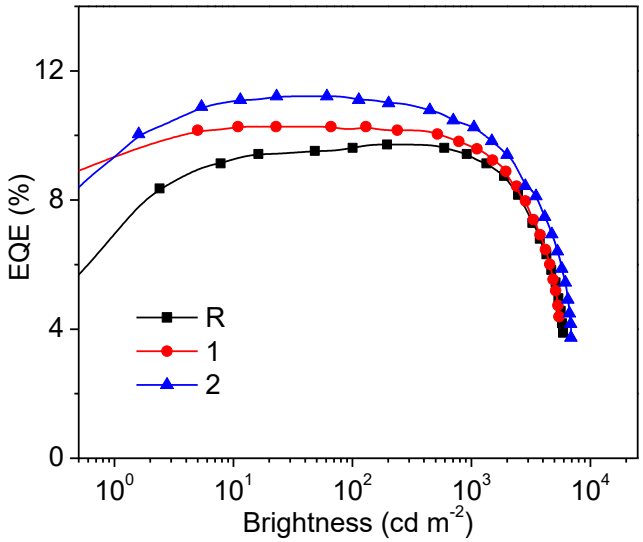


Figure S5. *EQE* versus brightness curves for OLEDs based on complexes R and 1-2.