Electronic Supporting Information

Photoactive rare earth complexes for fluorescent tuning and sensing cations (Fe^{3+}) and anions ($Cr_2O_7^{2-}$)

Xiang Shen, Bing Yan*

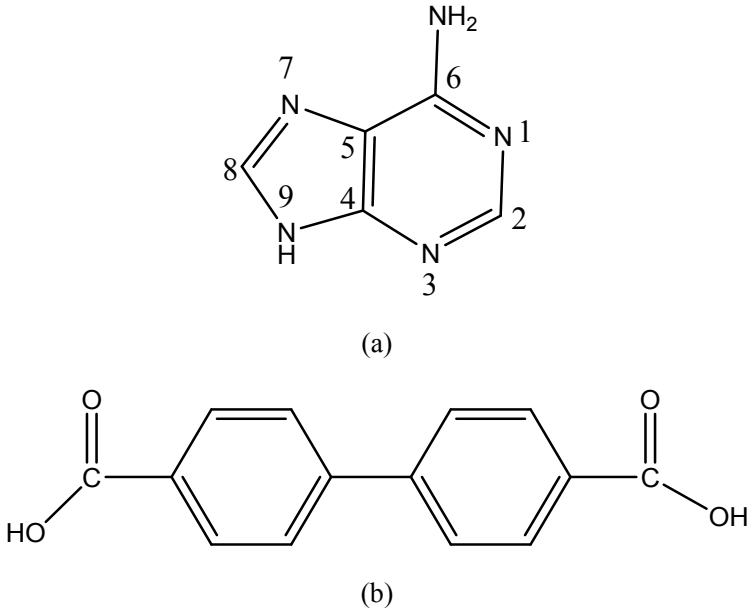


Figure S1 The chemical structures of adenine (a) and biphenyl-4,4'-dicarboxylic acid (b)

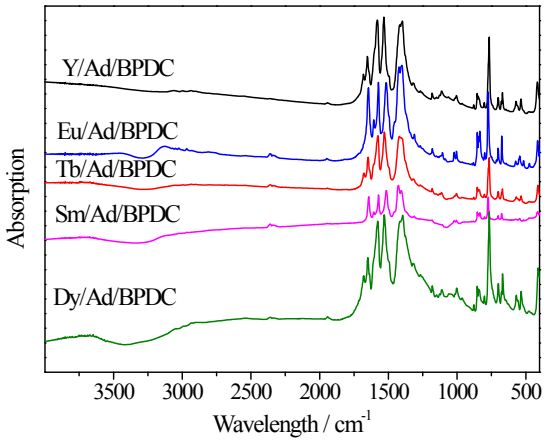


Figure S2 FT-IR spectra of RE/Ad/BPDC

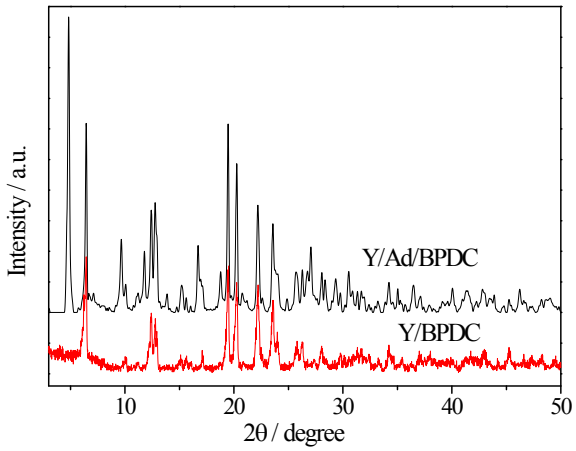


Figure S3 PXRD pattern of Y/Ad/BPDC (black) and binary Y complex of BPDC (red)

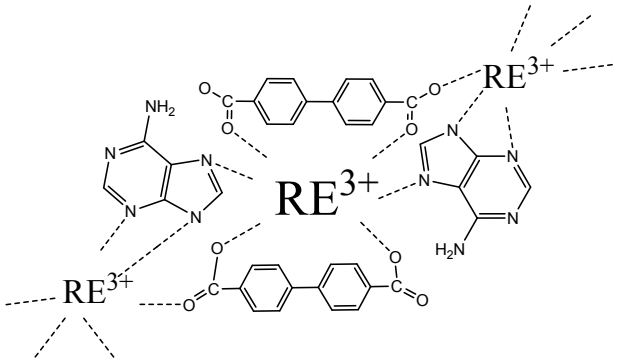
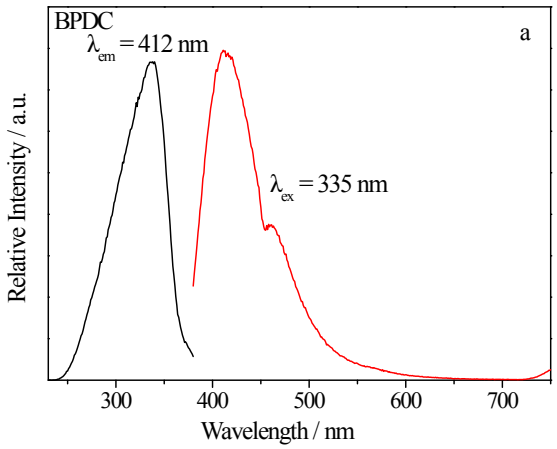


Figure S4 The inferred structure of rare earth complexes



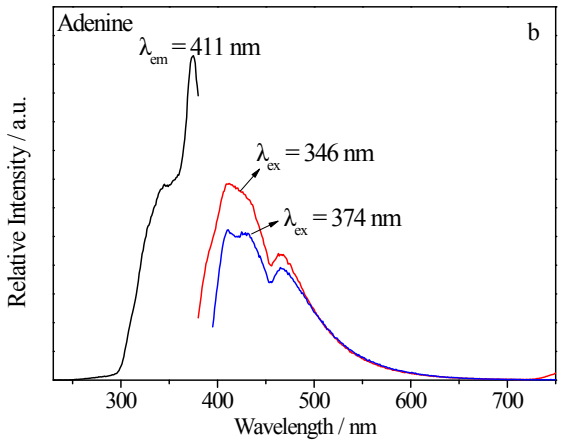


Figure S5 The excitation and emission spectra of pure BPDC (a) and adenine (b)

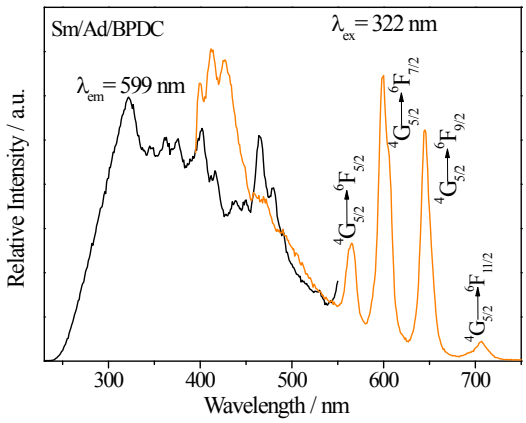


Figure S6 The excitation and emission spectra of Sm/Ad/BPDC

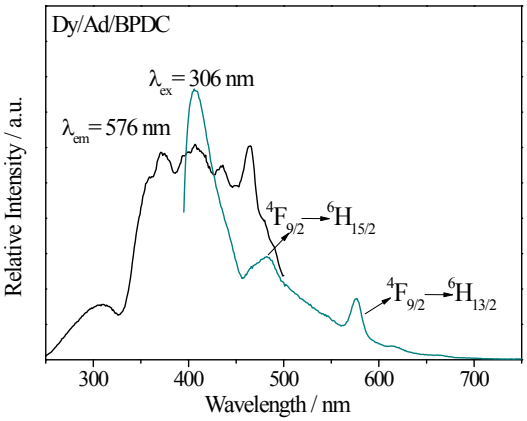


Figure S7 The excitation and emission spectra of Dy/Ad/BPDC

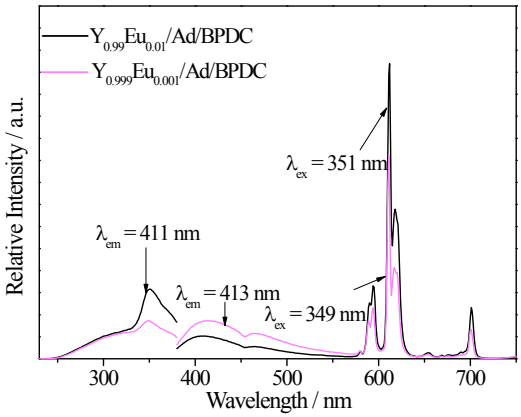


Figure S8 The excitation and emission spectra of $Y_{1-x}Eu_x$/Ad/BPDC excited at 351 nm and 349 nm which belongs to the excitation of organic ligands

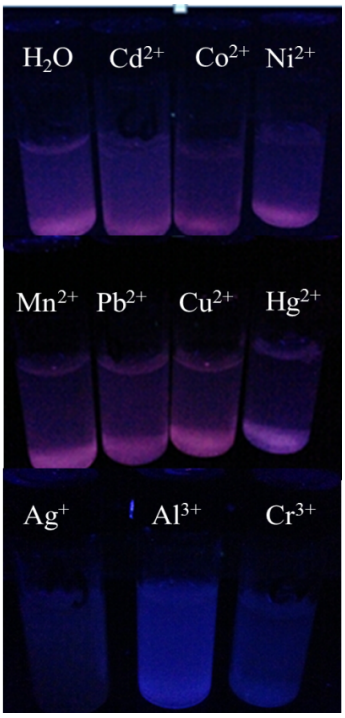


Figure S9 The photographs of $Y_{0.99}Eu_{0.01}$/Ad/BPDC in the metal ions aqueous (10^{-2} mol·L^{-1}) under UV-light irradiation at 365 nm

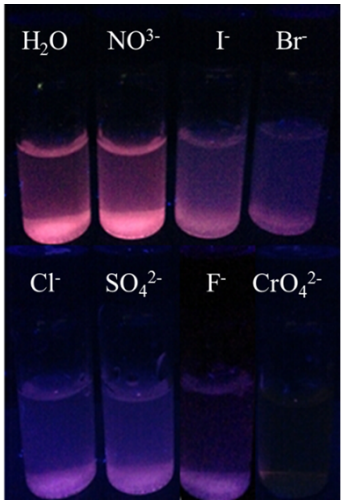


Figure S10 The photographs of $Y_{0.99}Eu_{0.01}$/Ad/BPDC in the anions aqueous (10^{-2} mol·L^{-1}) under UV-light irradiation at 365 nm

Table S1 Changes of wavenumbers in FTIR spectra

	νRing	νBenzene Ring	asym νCOO$^-$	sym νCOO$^-$	Asym δN9H	νC2N3,νC5C6, δC2H	νC5N7
Adenine	1603				1330	1308	1124
BPDC		1606	1685	1427			
Y/Ad/BPDC	1580	1600~1500	1681	1400			

ν, stretching vibration; δ, deformation vibration; sym, symmetric vibration; asym, asymmetric vibration.

the unit of wavenumber is cm^{-1}

Table S2 Quenching effect coefficients (K_{sv}) of different metal ions on the luminescent intensity of metal ion-incorporated $Y_{0.99}Eu_{0.01}$/Ad/BPDC

Metal ions	$K_{sv}[M^{-1}]$
Co^{2+}	10
Cd^{2+}	17
Ni^{2+}	19
Mn^{2+}	67
Pb^{2+}	194
Cu^{2+}	285
Hg^{2+}	317
Al^{3+}	553
Ag^{+}	9121
Cr^{3+}	26704
Fe^{3+}	6031920