

Base-Driven Keto-Enol Anion Tautomerism of Perylene

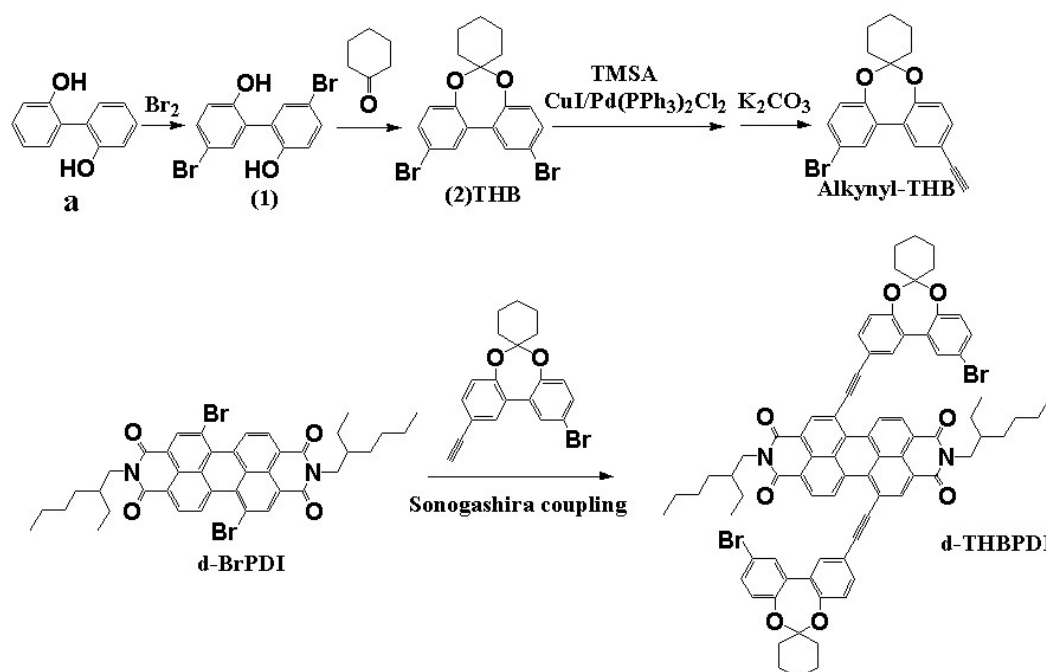
Diimide Derivative in DMF Solution

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Scheme 1 synthesis route of d-THBPDI

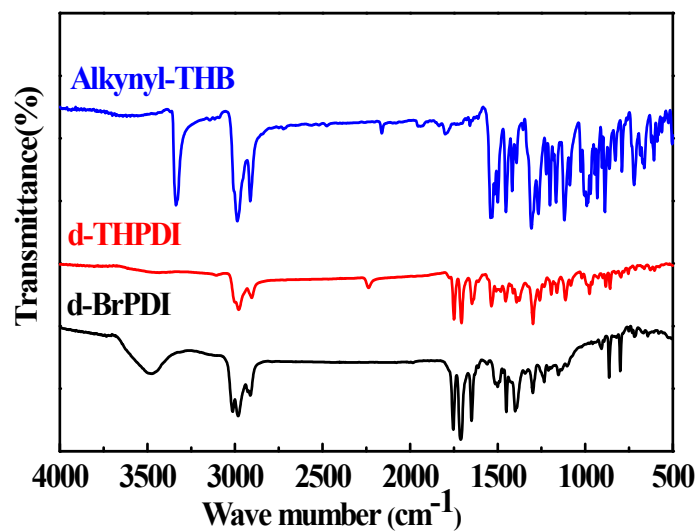


Fig. S1 FT-IR spectra of d-BrPDI, Alkynyl-THB and title compound d-THBPDI

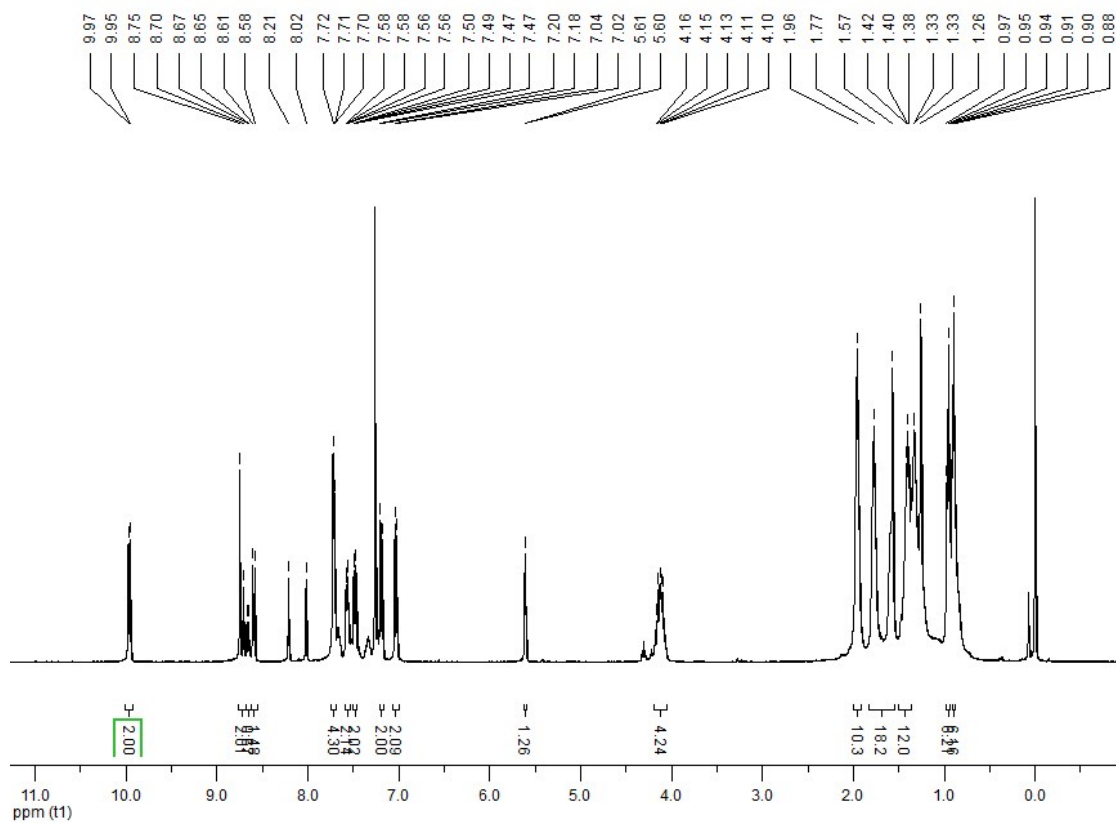


Fig. S2 ^1H NMR spectra of title compound d-THBPDI

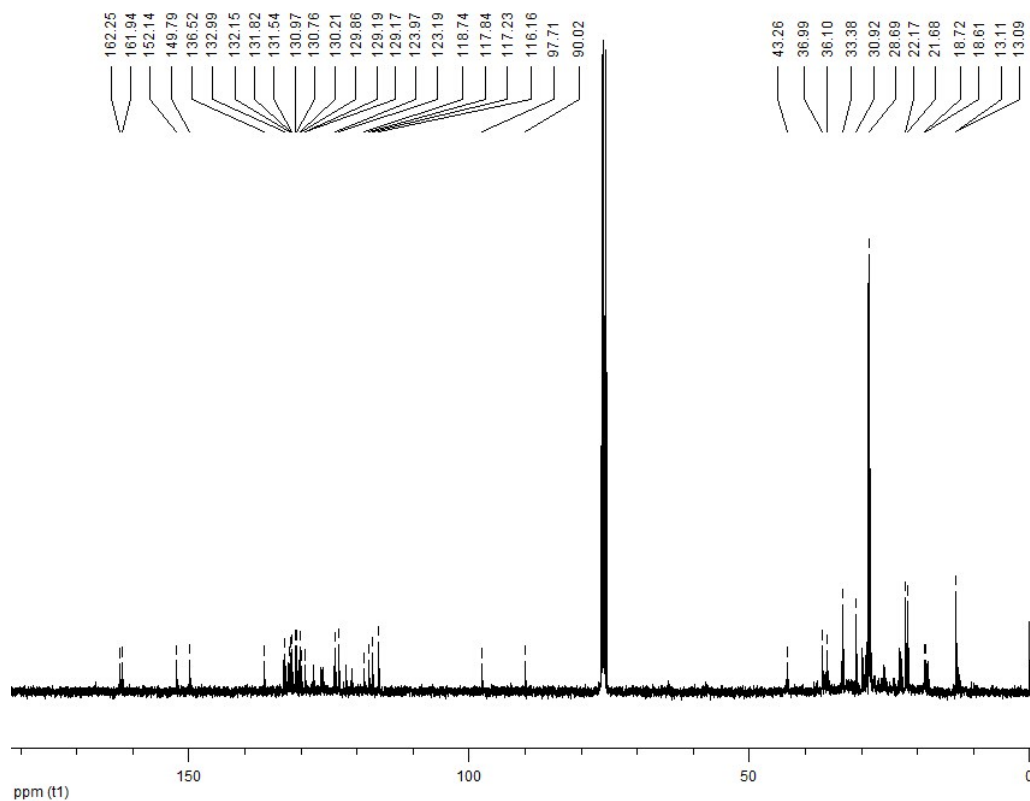


Fig. S3 ^{13}C NMR spectra of title compound d-THBPDI

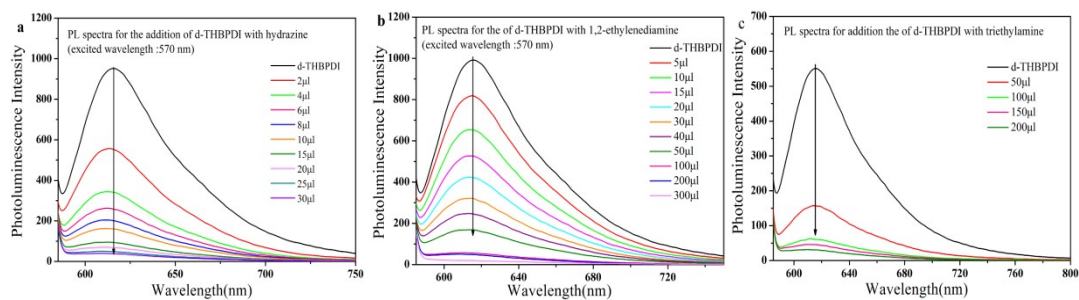
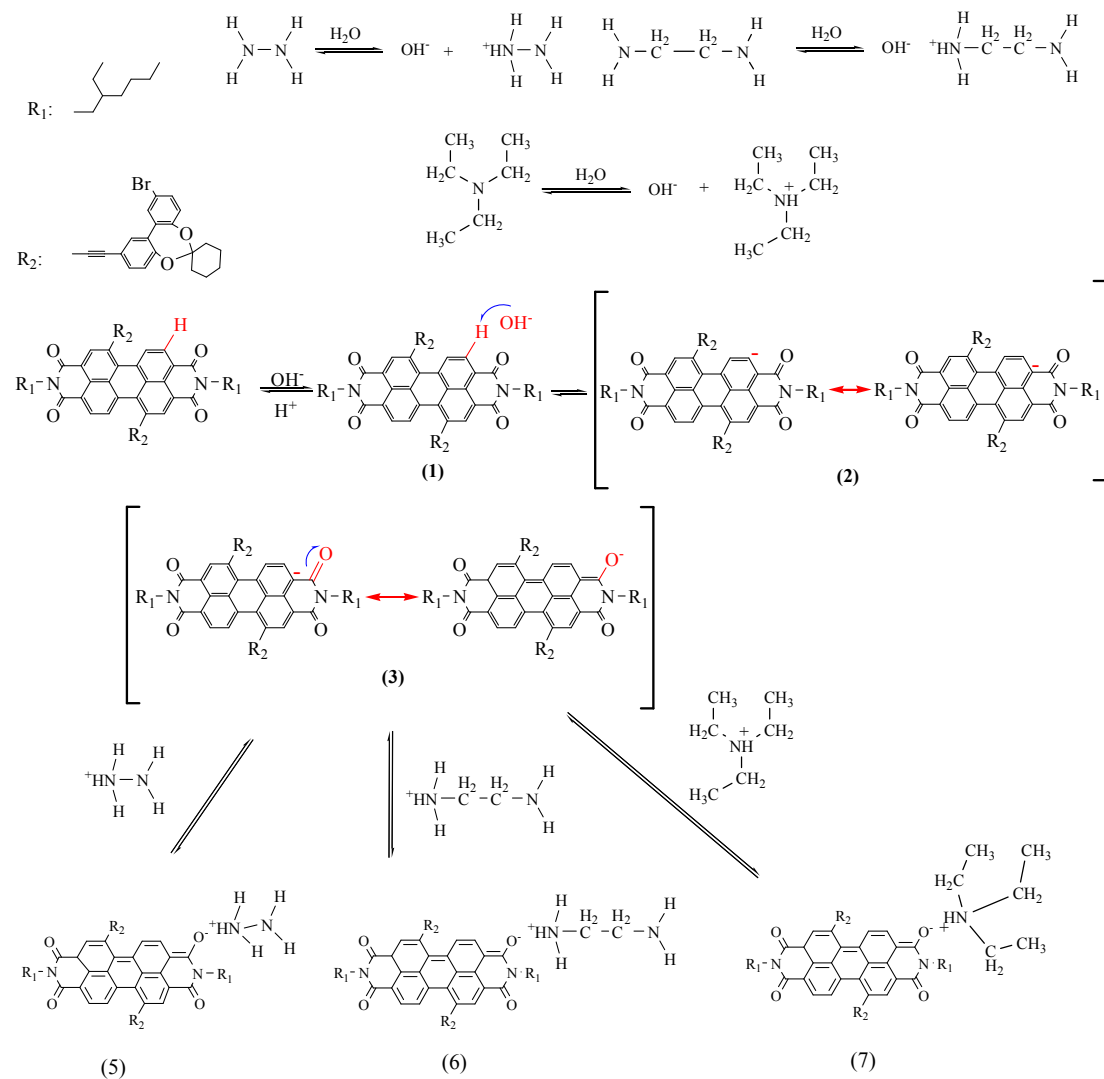
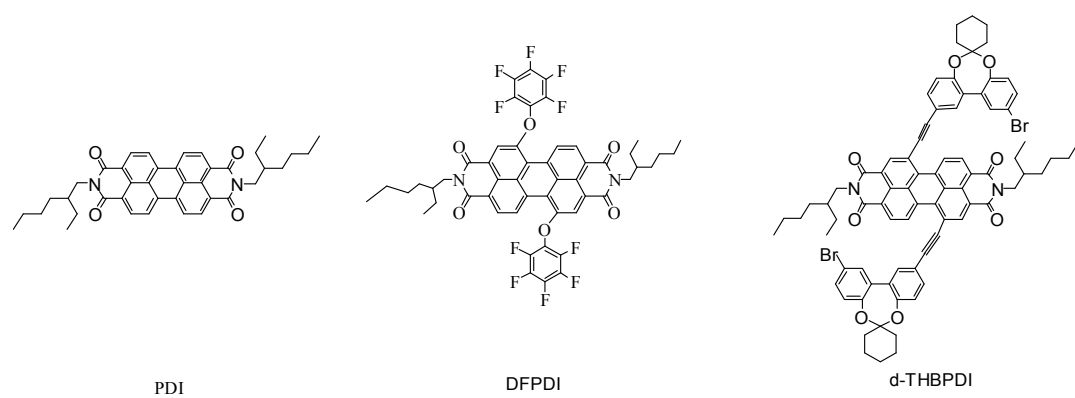


Fig. S4 Photoluminescence spectra of d-THBPDI upon adding various organic bases of different volume



Scheme 2 Organic base-driven keto-enol anion tautomerism mechanism of d-THBPDI \leftrightarrow d-THBPDI⁻



Scheme 3 The molecule structure of PDI, DFPDI and d-THBPDI.

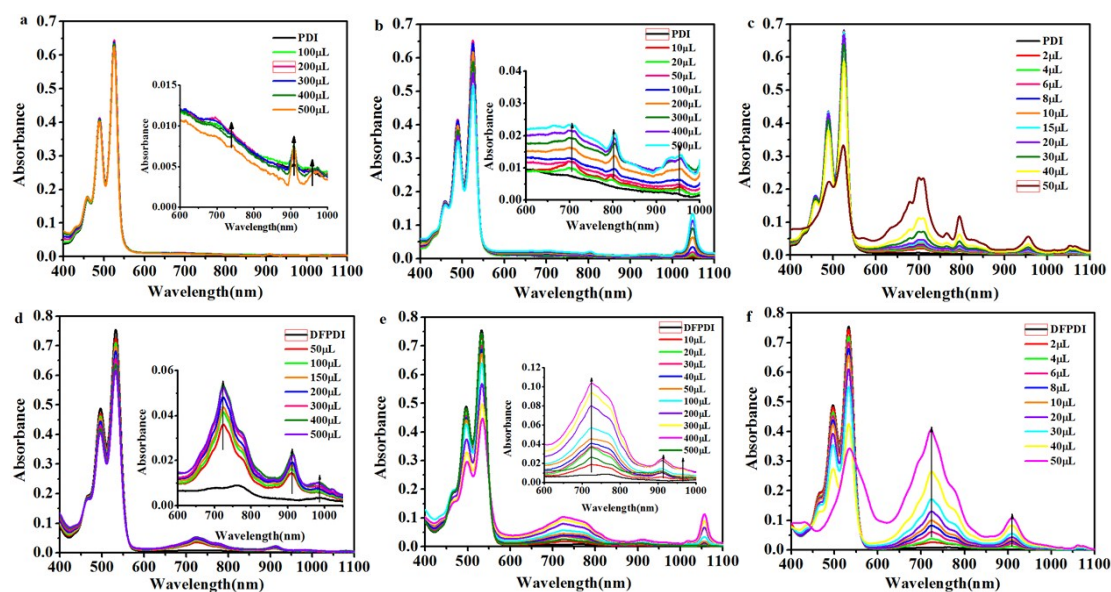


Fig. S5 UV-vis spectra of PDI (a, b and c) and DFPDI (d, e and f) in the different amount of triethylamine, ethanediamine and hydrazine, respectively.

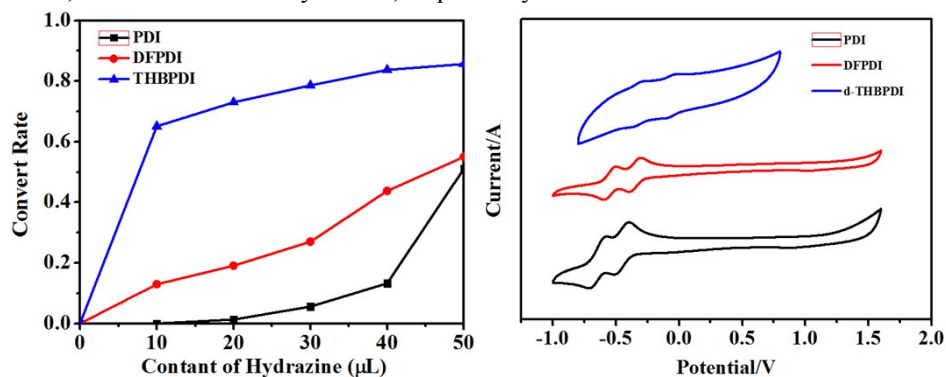


Fig. S6 The convert rate of PDI, DFPDI and d-THBPDI with addition of hydrazine (a) Cyclic voltammety of PDI, DFPDI and d-THBPDI containing $[nBu_4N][PF_6]$ (0.1M) with respect to Ag/AgCl in DMF (b)

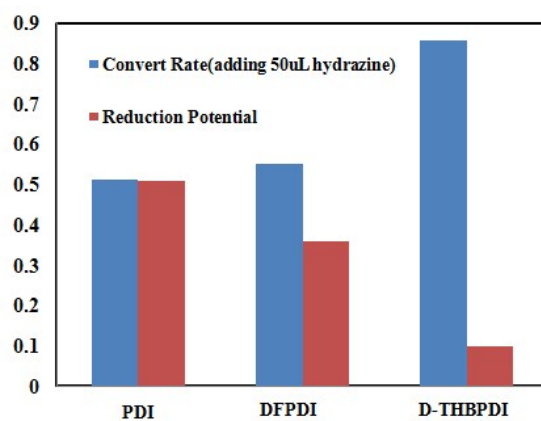


Fig. S7 The convert rate of PDI, DFPDI and d-THBPDI with adding 50 μ L hydrazine (blue) and their absolute value of reduction potential (red).