Supporting Information

Chemical control of photochromism and a multiresponsive molecular switch based on a diarylethene derivative containing naphthol

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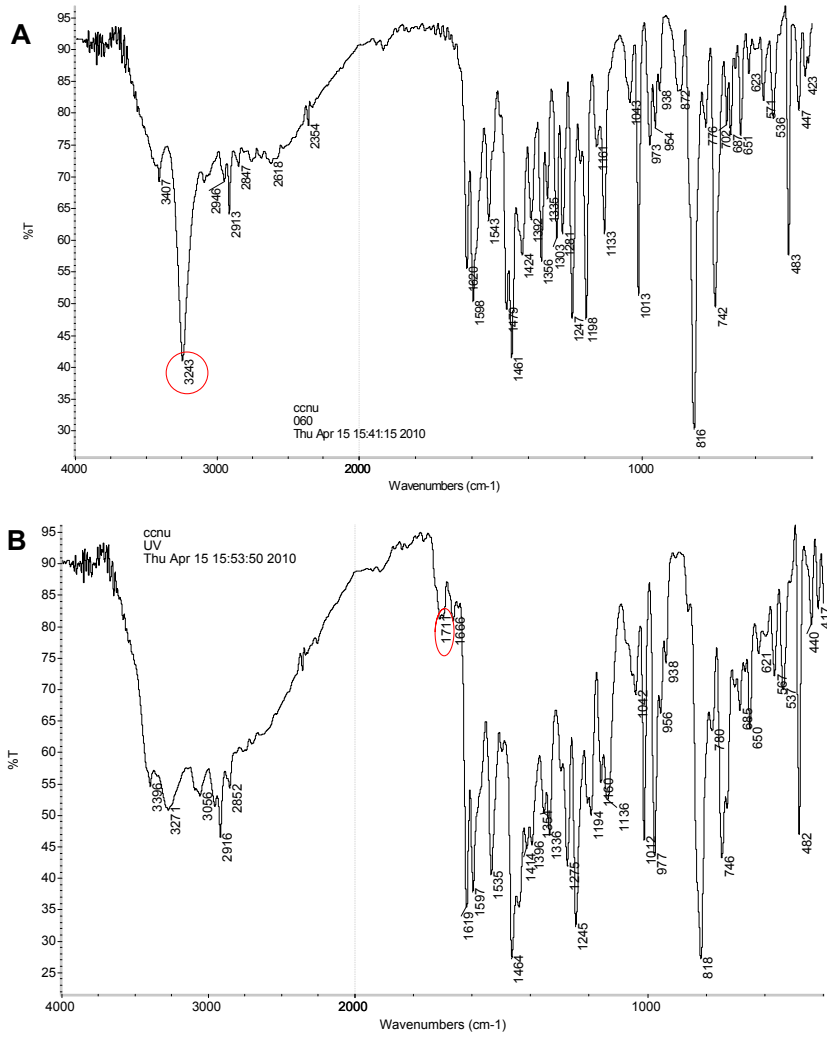

Figure S1: IR spectrum of diarylethene **DIN** before and after UV irradiation.(A: IR spectrum before UV irradiation; B: IR spectrum after UV irradiation).

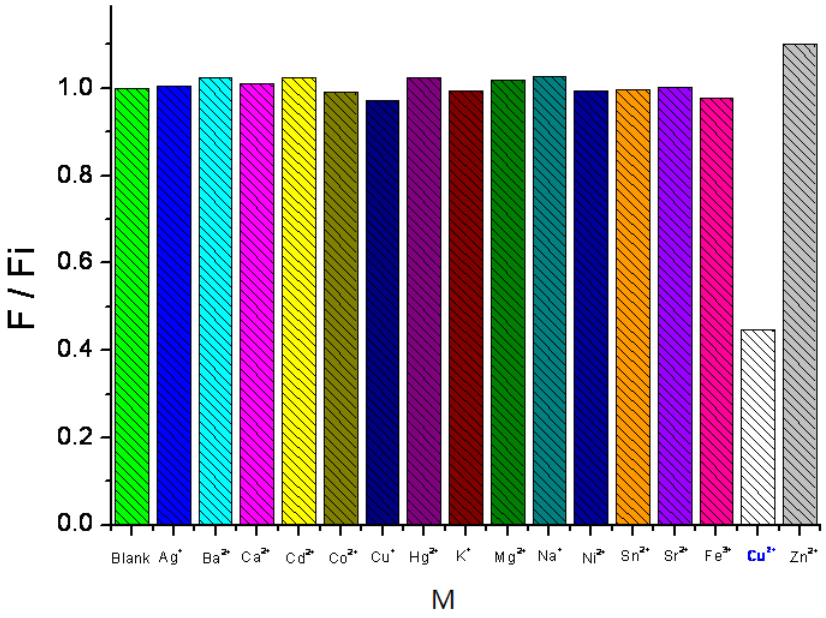

Figure S2: Fluorescence responses of **DIN** to various ions in acetontrile (c = 2 × 10^{-5} mol/L). F/Fi represents the final integrated emission (F) over initial integrated fluorescence response (Fi).

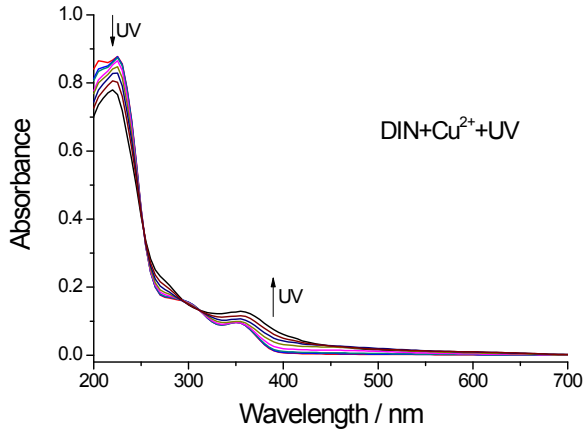

Figure S3: Optical response of diarylethene **DIN** in acetontrile upon the addition of Cu^{2+} after irradiation with 302 nm.

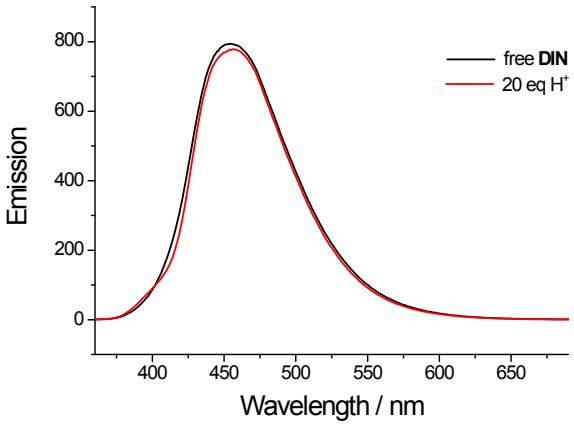

Figure S4: Fluorescence responses of diarylethene **DIN** in acetontrile (c = 2 × 10^{-5} mol/L) upon protonation with HCl (20 eq).

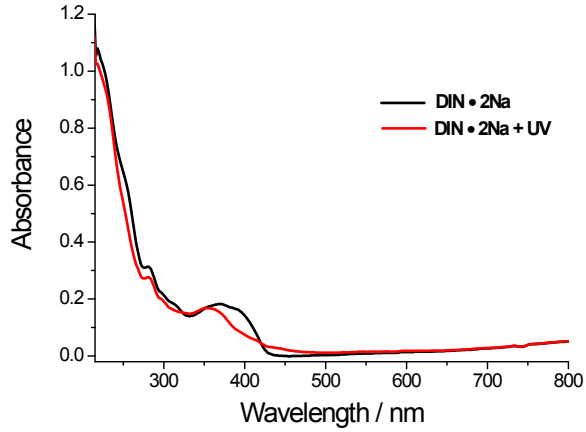

Figure S5: Absorbance responses of diarylethene **DIN•2Na** in acetontrile (c = 2 × 10^{-5} mol/L) upon the addition of NaOH (10 eq) upon irradiation with UV light.

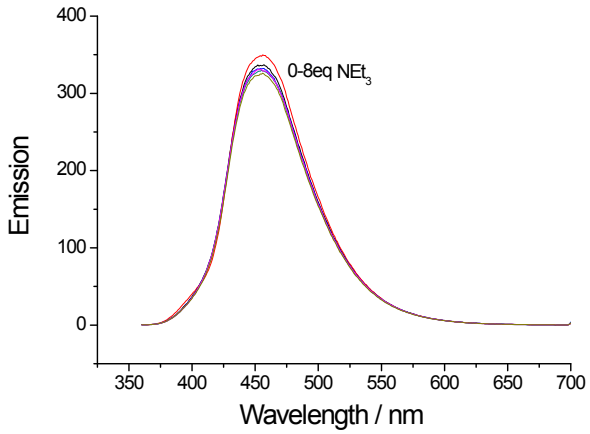

Figure S6: Fluorescence responses of diarylethene **DIN** in acetontrile (c = 2 × 10^{-5} mol/L) upon the addition of NEt_3 (0-8 eq).

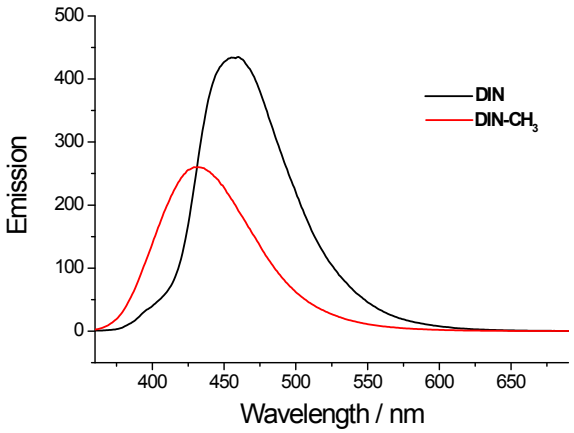

Figure S7: Fluorescence changes of diarylethenes **DIN** and **DIN•CH$_3$** in acetontrile (c = 2 × 10^{-5} mol/L) before irradiation with UV light.

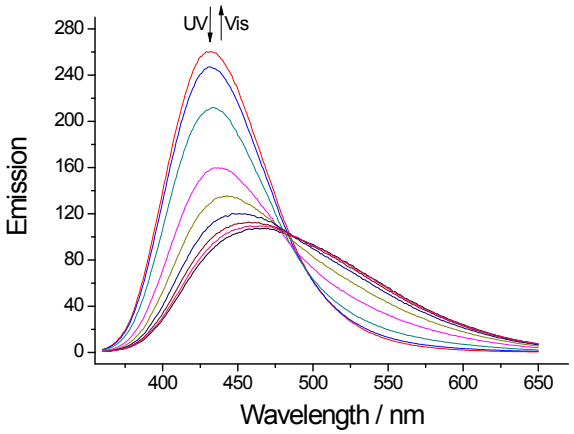

Figure S8: Fluorescence responses of diarylethene **DIN•CH$_3$** in acetontrile (c = 2 × 10^{-5} mol/L) upon irradiation with UV and visible light.

Table S1: Crystal data and structure refinement parameters for **DIN**.

	DIN
Empirical formula	$C_{23}H_{16}Cl_2N_2O\,S_2$
Formula weight	471.40
Temperature	298(2) K
Wavelength	0.71073 Å
Crystal system	Orthorhombic
Space group	P2(1)2(1)2(1)
a (Å)	7.366(4)
b (Å)	8.121(4)

c (Å)	36.109(17)
α(deg)	90
β(deg)	90
γ(deg)	90
Volume(Å^{-3})	2160.0(18)
Z	4
Density (calculated)	1.450 Mg/m^{3}
Absorption coefficient	0.512 mm^{-1}
F(000)	968
Crystal size	0.20 × 0.10 × 0.10 mm^{3}
Theta range for data collection	2.57 to 25.99°.
Index ranges	-9<=h<=8, -9<=k<=9, -44<=l<=19
Reflections collected	9666
Independent reflections	4173 [R(int) = 0.1408]
Completeness to theta = 26.00	99.6 %
Absorption correction	None
Max. and min. transmission	0.9506 and 0.9045
Refinement method	Full-matrix least-squares on F^{2}
Data / restraints / parameters	4173 / 0 / 274
Goodness-of-fit on F^{2}	1.072
Final R indices [I>2sigma(I)]	R1 = 0.0721, wR2 = 0.1689
R indices (all data)	R1 = 0.0999, wR2 = 0.1774
Largest diff. peak and hole	0.294 and -0.309 e^{-3}