Supporting Informations

Origin of Strong Synergism in Weakly Perturbed Binary Solvent System: A Case Study of Primary Alcohols and Chlorinated Methanes

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Figure S1. Absorption maxima of C480 plotted against volume fraction of (a) ethanol in EtOH-CCl_4 and (b) *n*-butanol in *n*-BuOH-CCl_4 binary mixture.

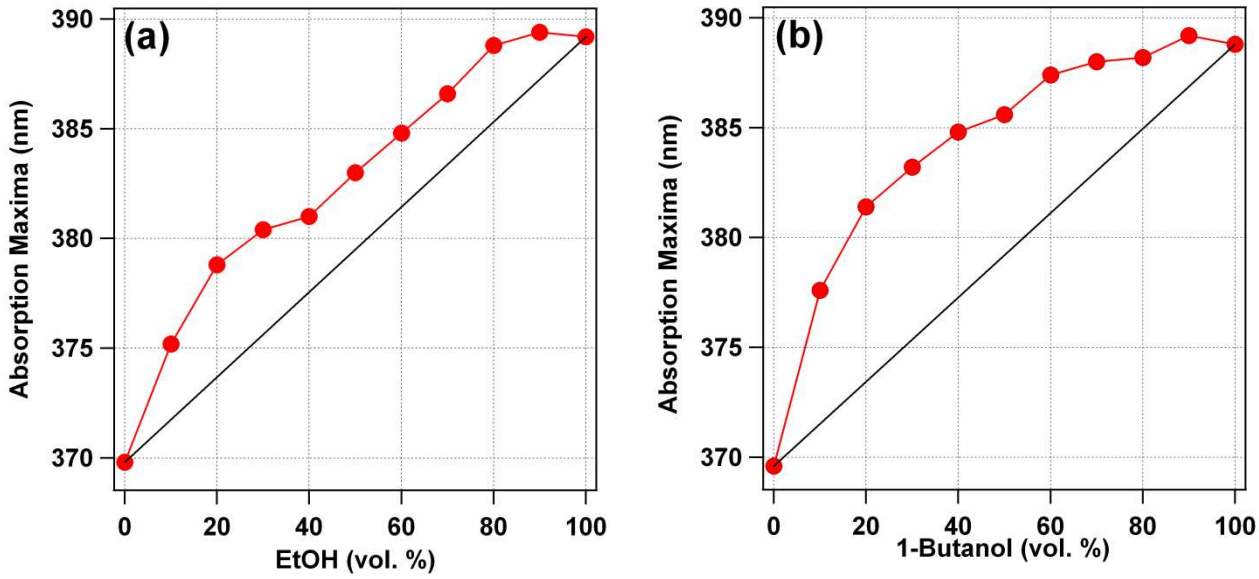

Figure S2. Absorption maxima of C480 plotted against the mole fraction of; (a) ethanol in EtOH-$CHCl_3$ mixture and (b) *n*-butanol in *n*-BuOH-$CHCl_3$ binary mixture.

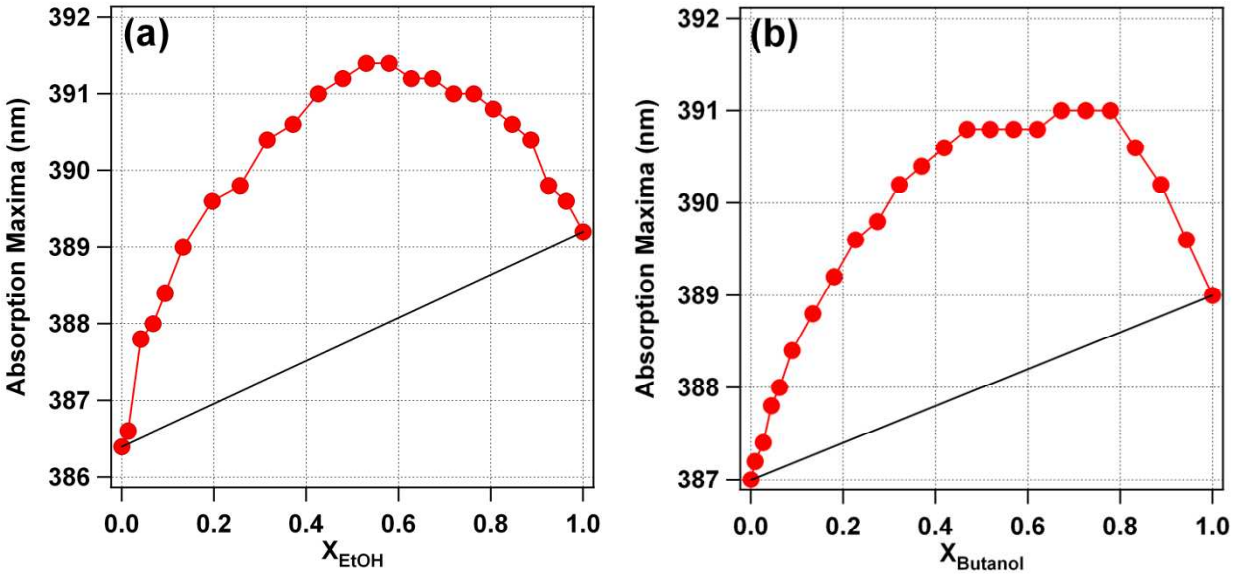

Figure S3. Plot showing the difference between ideal and experimental molar electronic transition energy, E_T (ΔE_T) as function of X_{MeOH} in MeOH-$CHCl_3$ binary mixture.

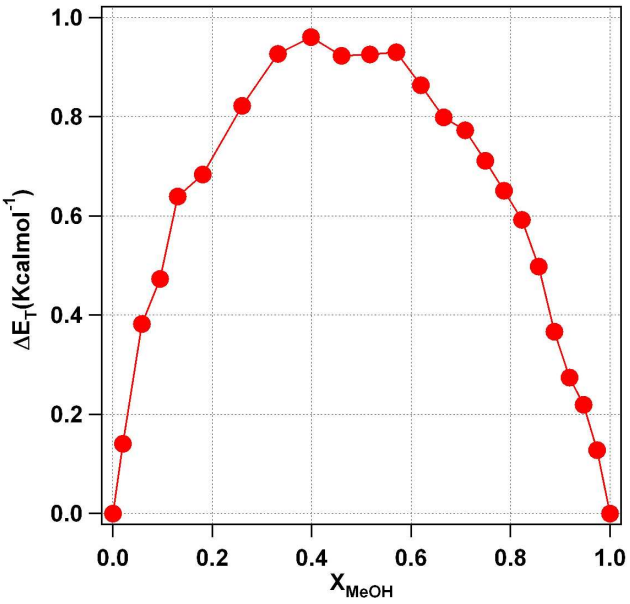

Figure S4. Molar refractivity difference between the experimental and theoretical values in EtOH-$CHCl_3$ and *n*-BuOH-CCl_4.

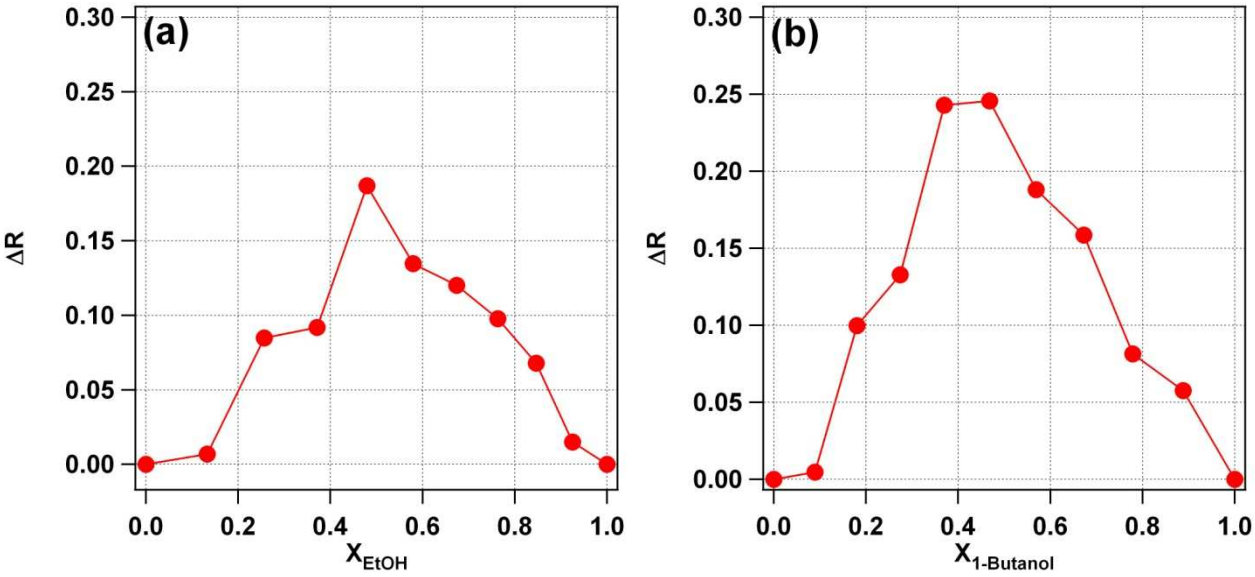

Figure S5. Proton NMR spectra of bulk MeOH, bulk $CHCl_3$ and 18 samples of MeOH-$CHCl_3$ binary solvent mixture with different mole fractions showing only the chemical shift of $CHCl_3$ proton.

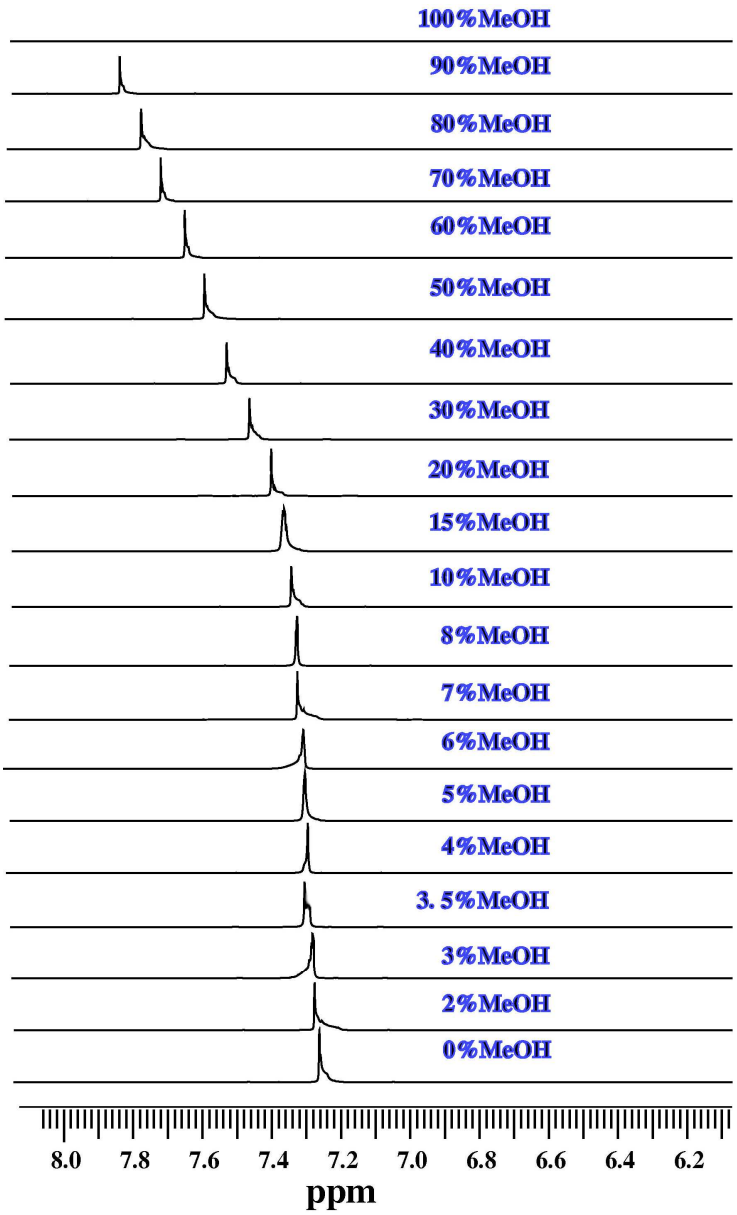

Figure S6. Proton NMR spectra of bulk MeOH, bulk $CHCl_3$ and 18 samples of MeOH-$CHCl_3$ binary solvent mixture with different mole fractions showing only the chemical shift of MeOH – OH proton.

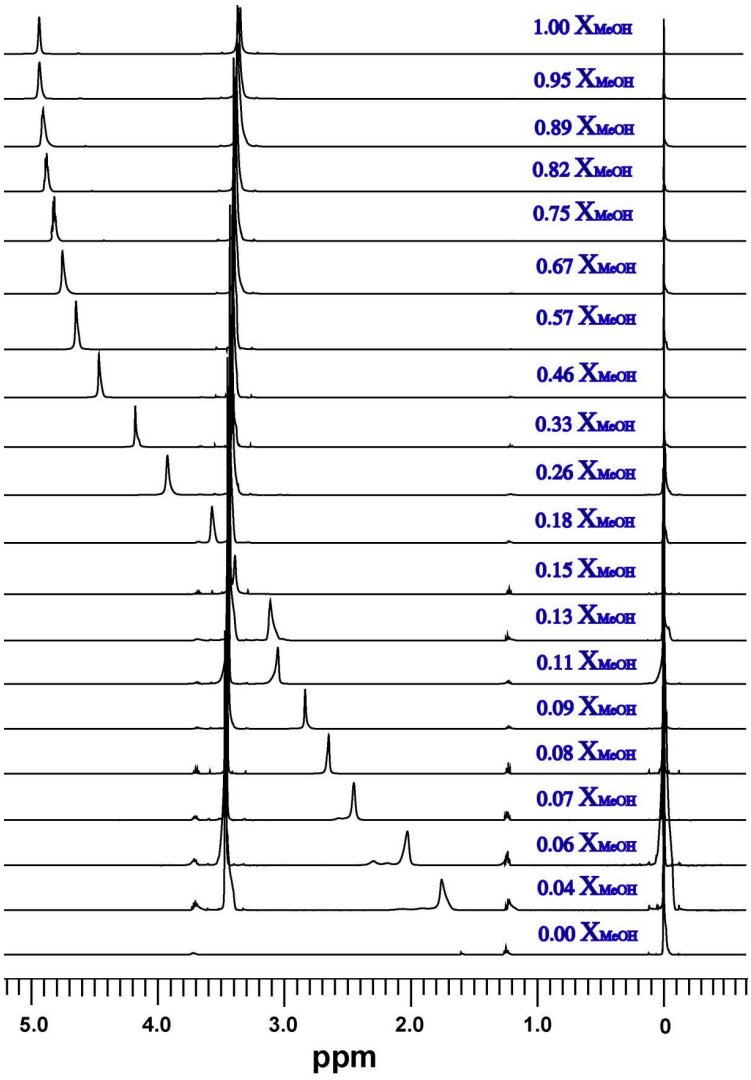

Figure S7. Proton NMR spectra of C480 in bulk MeOH, bulk $CHCl_3$ and 0.46 mole fraction of MeOH in MeOH-$CHCl_3$ binary solvent mixture. The numbers in red ink represent the protons whose chemical shift position changes as a function of solvent (proton NMR peaks which are not assigned, are solvent peaks).

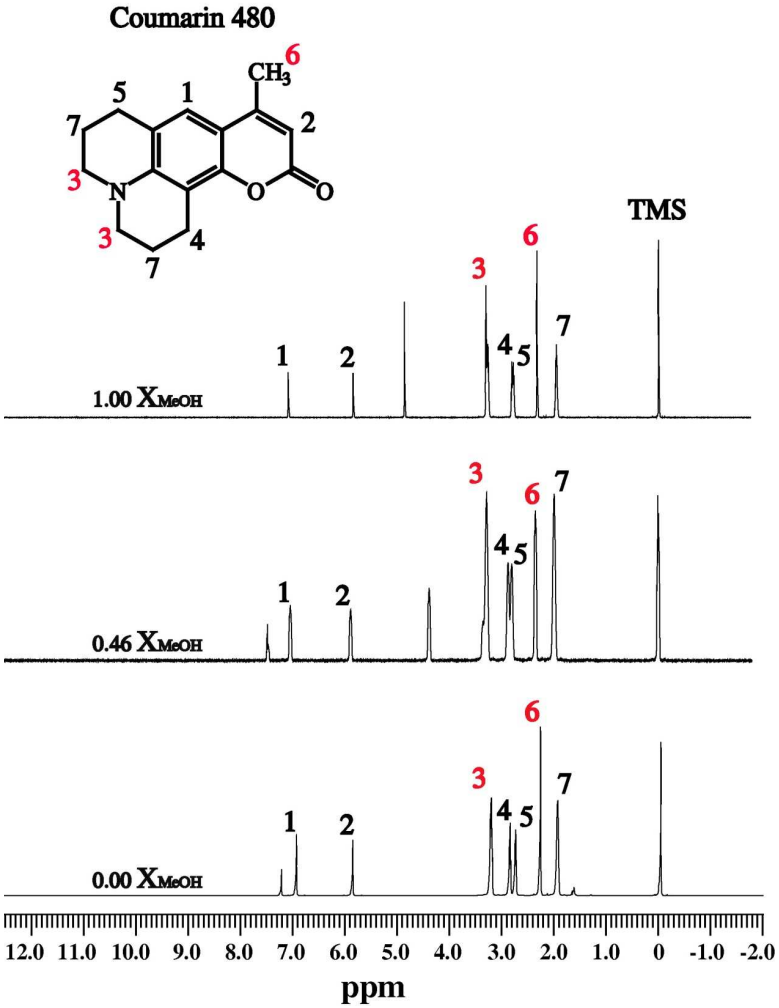

Figure S8. Difference of the experimental value of quenching constant and the ideal value showing maximum deviation for 0.46 mole fraction of MeOH in MeOH-$CHCl_3$ binary mixture.

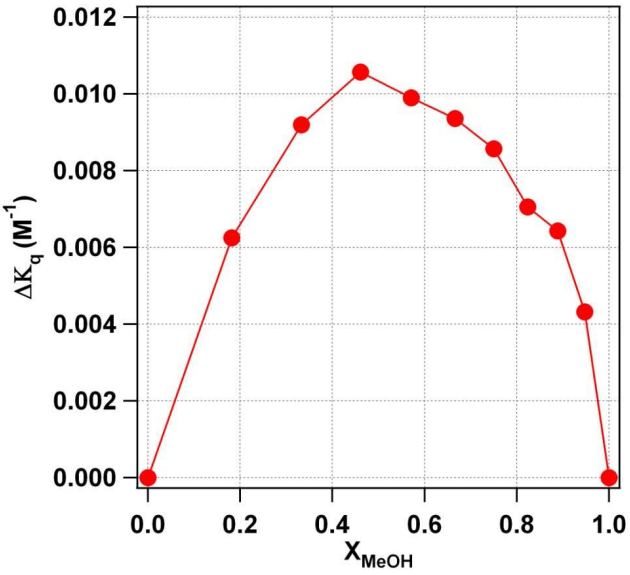

Figure S9. Stern-Volmer plots of C480 with 1,2-phenylenediamime used as a quencher in bulk MeOH, bulk $CHCl_3$ and 9 different mole fractions of MeOH in MeOH-$CHCl_3$ binary mixture.

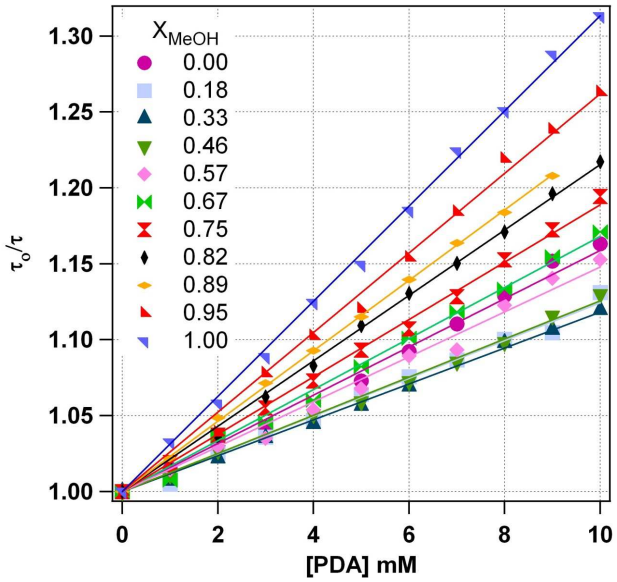

Table 1. Ground and Excited state dipole moments of different probe molecules used in the study.

Compounds	μ_g (D)	μ_e (D)
PNA	8.8[1]	6.6[1]
C480	6.38[2]	13.10[2]
C153	6.55[3]	14.48[3]
4-AP	5.0[4]	10.6[4]

1. Kuznetsova, V.; Morozova, P.; Bazyl O. K.; Korolev, B. V. *Rus. Phys. J.* **2000**, *43*, 608.
2. Choi, J. Y.; Park, E. J.; Chang, S. H.; Kang, T. J. *Bull. Korean Chem. Soc.* **2009,** *30*, 1452.
3. Muhlpfordt, A.; Schanz, R.; Ernsting, N. P.; Farztdinov, V.; Grimme, S. *Phys. Chem. Chem. Phys.* **1999**, *1*, 3209.
4. Sajadi, M.; Obernhuber, T.; Kovalenko, S. A.; Mosquera, M.; Dick, B.; Ernsting, N. P. *J. Phys. Chem. A* **2009**, *113*, 44.

Table 2. Chemical shift of C480 protons in proton NMR spectrum. The proton corresponding to the numbers in the table are shown in scheme 1.

Position of proton	CD_3OD	0.46 X_{CD3OD}	$CDCl_3$
1	7.084	7.045	7.004
2	5.843	5.898	5.925
3	3.258	3.280	3.266
4	2.802	2.874	2.915
5	2.670	2.794	2.794
6	2.321	2.362	2.321
7	1.946	2.011	1.997

Table 3. The table below shows the magnitude of quenching constants obtained from the Stern-Volmer plots of fluorophore C480 quenched by 1,2-phenylenediamine in bulk MeOH, bulk $CHCl_3$ and 9 different mole fractions of MeOH in MeOH-$CHCl_3$ binary mixture . The graphical representation of the variation of quenching constants with the mole fraction of MeOH in shown in figure S9.

X_{MeOH}	Kq M^{-1} ($x10^{-2}$)
0.00	1.5879
0.18	1.2432
0.33	1.1828
0.46	1.2565
0.57	1.4803
0.67	1.6818
0.75	1.8896
0.82	2.1545
0.89	2.3182
0.95	2.6195
1.00	3.1333