Electronic Supplementary Material (ESI) for Analytical Methods.

A triphenylamine-based aggregation-enhanced emission probe for viscosity and polarity analysis of lubricating oils

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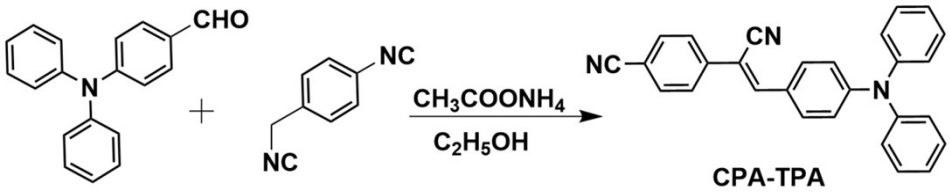
Supplementary information

Contents



Scheme S1 Synthesis and structure of CPA-TPA.

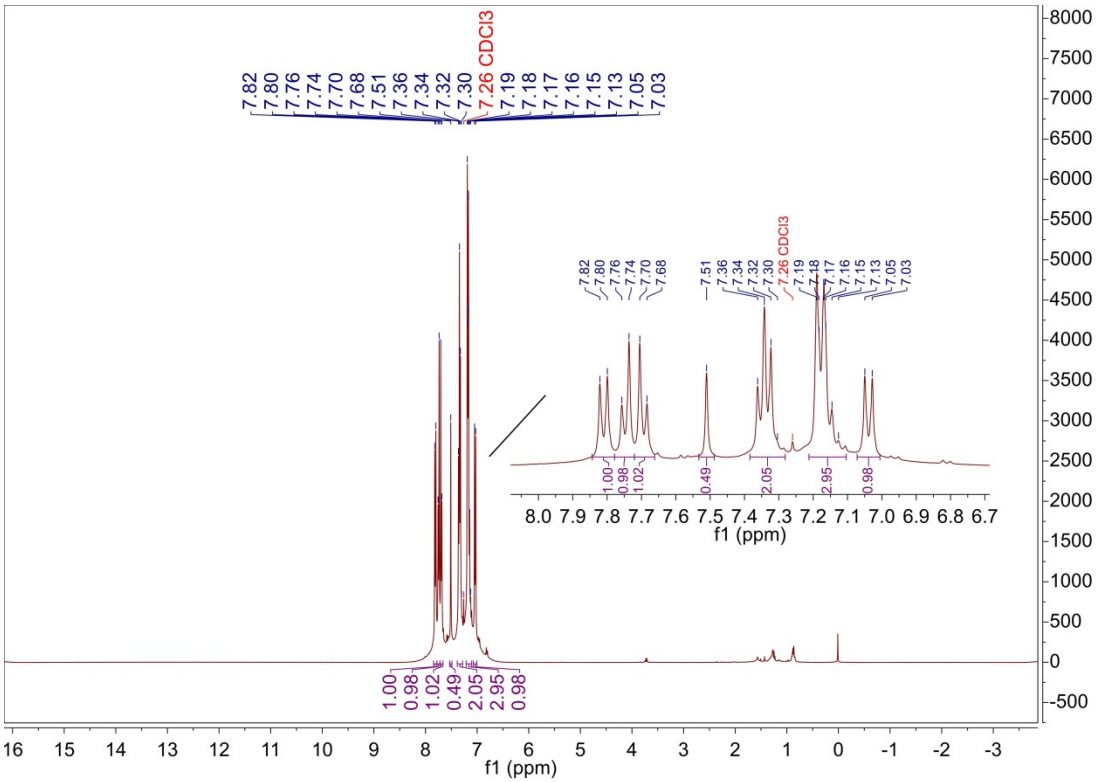


Fig. S1 ^{1}H NMR spectrum of compound CPA-TPA in $CDCl_3$.

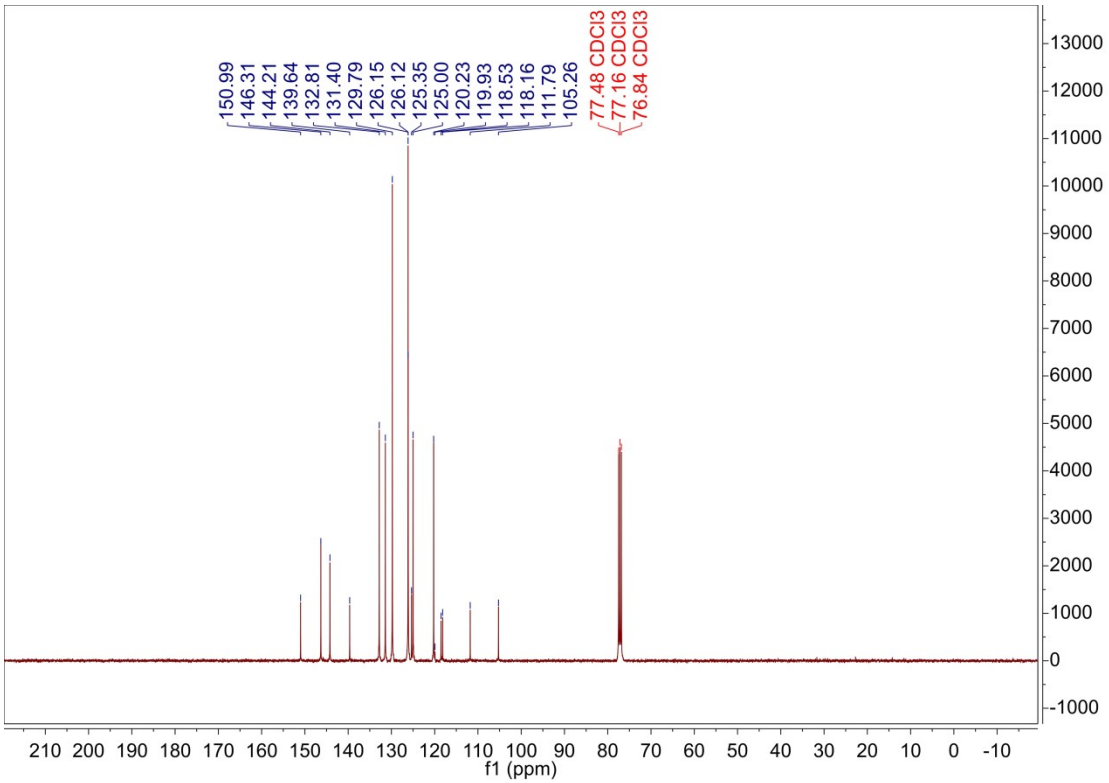


Fig. S2 ^{13}C NMR spectrum of compound CPA-TPA in $CDCl_3$.

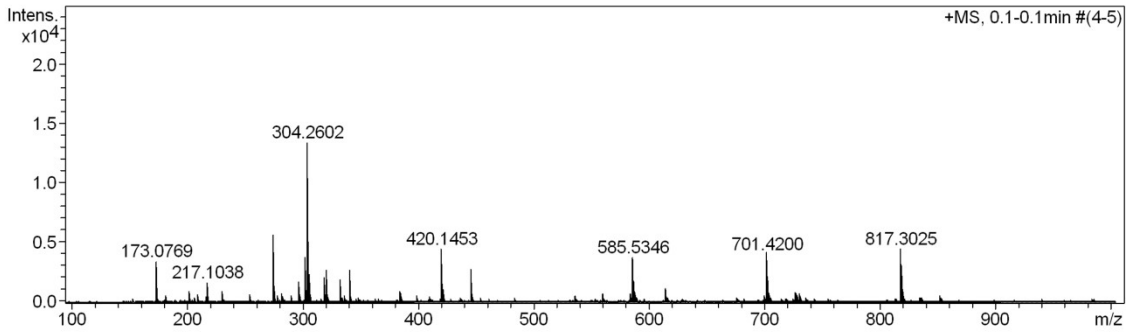


Fig. S3 HRMS spectrum of compound CPA-TPA.

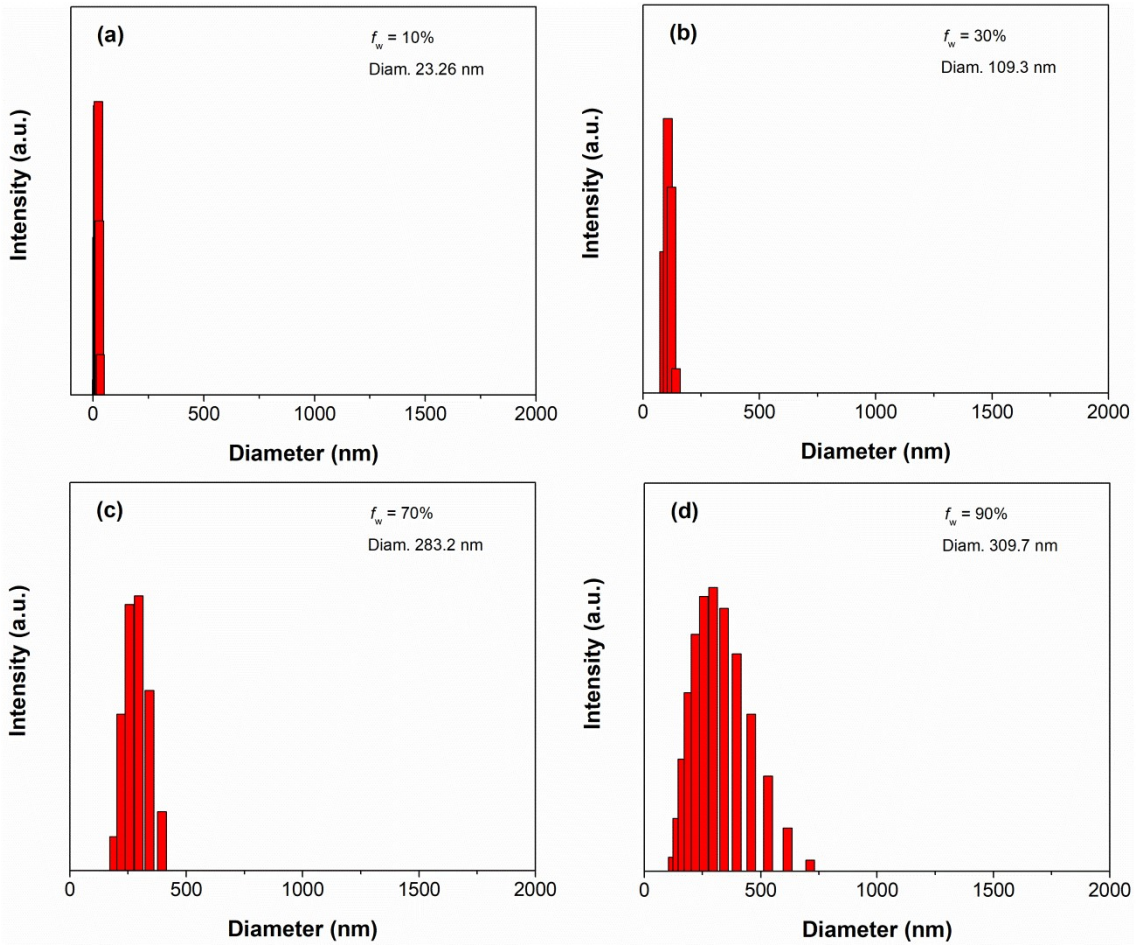


Fig. S4 Particle size distribution of CPA-TPA aggregates in H_2O/DMF mixtures with varying water proportions: (a) f_w = 10%, (b) f_w = 30%, (c) f_w = 70%, and (d) f_w = 90%.

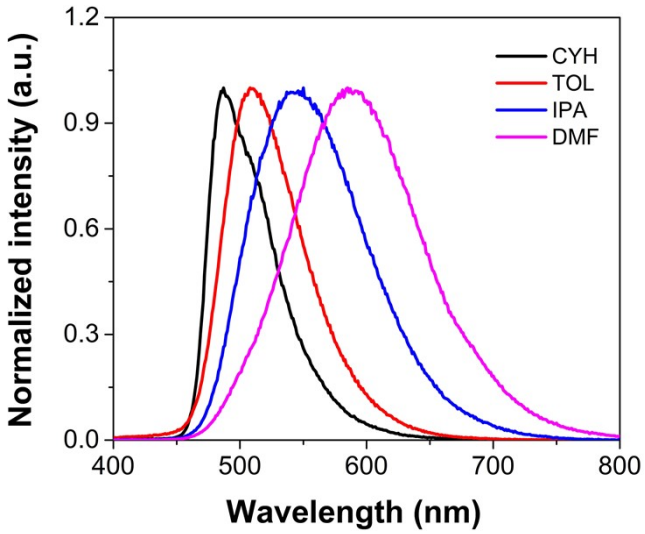


Fig. S5 Normalized emission spectra of standard solution B in solvents with varying polarity.

Table. S1 Real kinematic viscosity, v_r, of PAO40/PAO4 mixtures and the kinematic viscosity (v_a and v_b) of PAO40/PAO4 mixtures after adding standard solution A or B.

wt.% PAO40/PAO4	v_r mm^2/s	v_a mm^2/s	v_b mm^2/s
PAO40	708.18	572.90	317.86
90 %	472.94	394.13	244.74
80 %	304.01	278.29	162.48
70 %	230.39	195.81	119.42
60%	154.27	137.17	85.88
50%	111.16	99.72	63.79
40%	78.46	73.77	47.61
30%	60.65	54.54	33.02
20%	44.90	38.30	24.04
10%	30.31	28.30	19.10
PAO4	22.17	22.17	15.12

Table. S2 Real kinematic viscosity of ester oil/PAO4 mixtures.

wt.% ester/PAO4	v_r mm^2/s (TMP)	v_r mm^2/s (DA)	v_r mm^2/s (PE)
Ester	24.65	34.51	28.36
80 %	23.55	29.88	27.37
60 %	22.82	26.40	26.08
40 %	22.39	24.05	24.81
20%	22.12	21.92	22.48
PAO4	20.79	20.79	20.79