

Supporting information

Linear Polymeric Ionic Liquids as Phase-transporter for Both Cationic and Anionic Dyes with Synergic Effect

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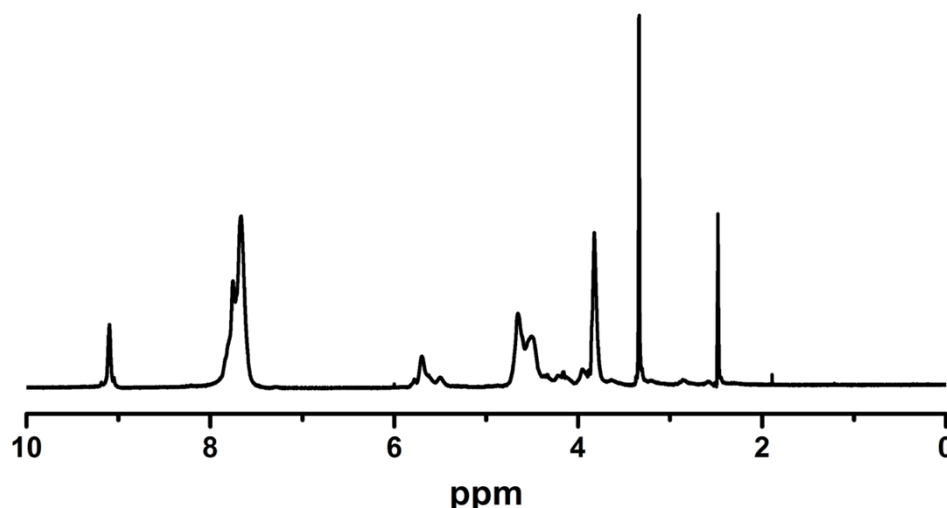
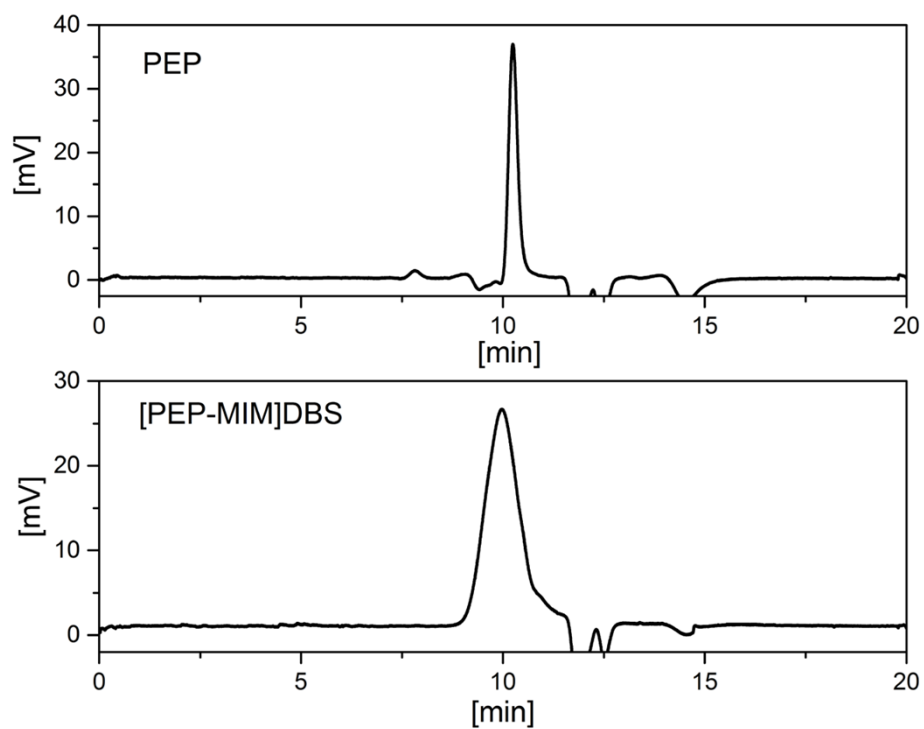


Fig. S1 ^1H NMR spectrum of [PEP-MIM] BF_4 .



	M_w	M_n	PDI
PEP	5490	4200	1.3
[PEP-MIM]DBS	23800	151	158.4

Fig. S2 GPC spectra of PEP and [PEP-MIM]DBS.

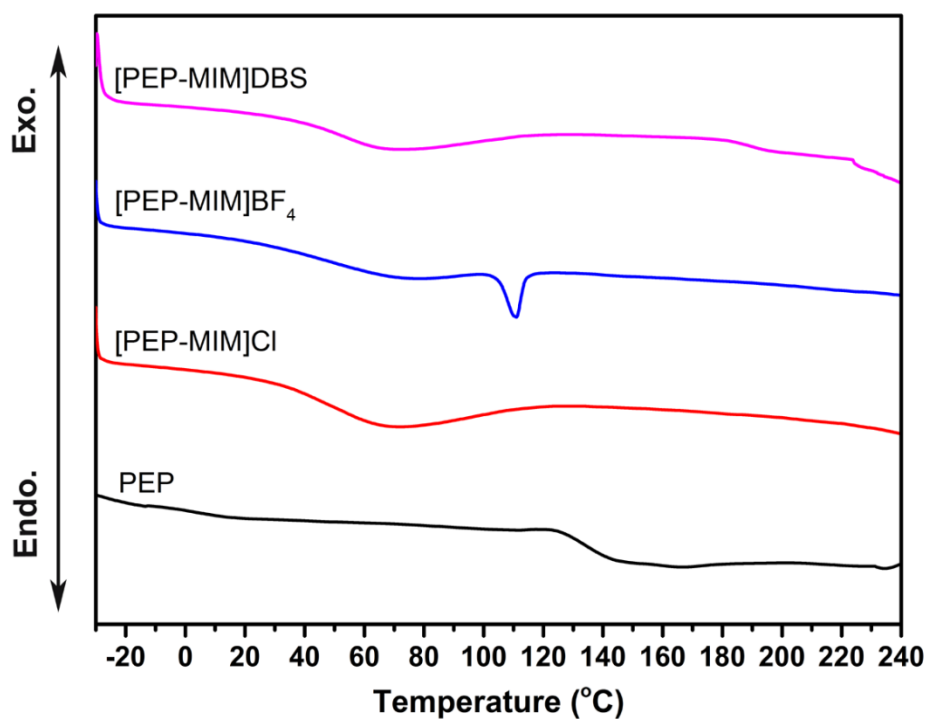


Fig. S3 The DSC curves of polyester and polymer ionic liquids

Table S1 Solubilities of polymeric ionic liquids with different anions.^[a]

	PEP	[PEP-MIM]Cl	[PEP-MIM]BF ₄	[PEP-MIM]DBS
H ₂ O	—	+	—	—
EtOH	—	+	—	—
Acetone	+	—	—	—
CHCl ₃	+	—	—	+
CH ₂ Cl ₂	—	—	—	+
CH ₃ CN	+	+	+	+
THF	+	—	—	—
Toluene	—	—	—	—
DMF	+	+	+	+
DMSO	+	+	+	+

^[a] + =soluble, — = insoluble. DBS = dodecyl benzene sulfonate.

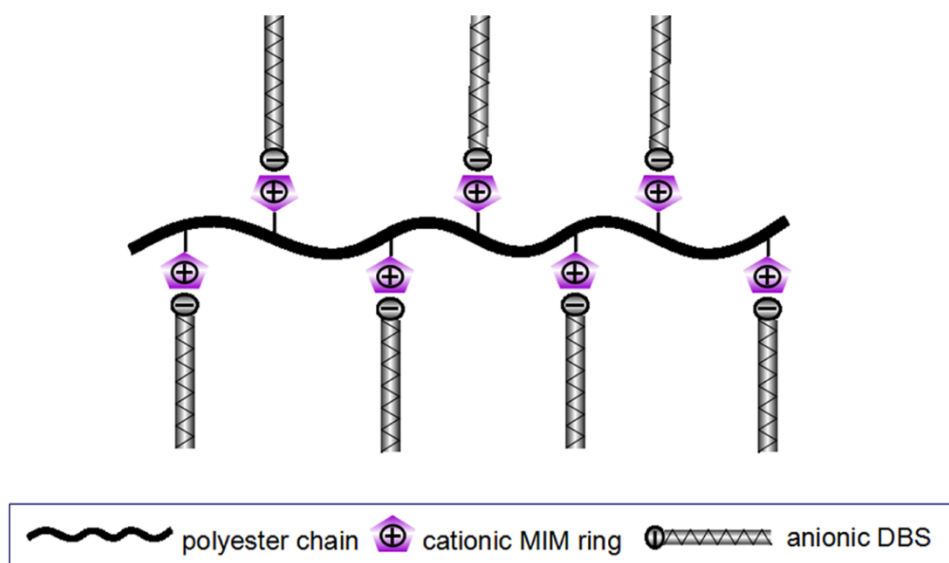
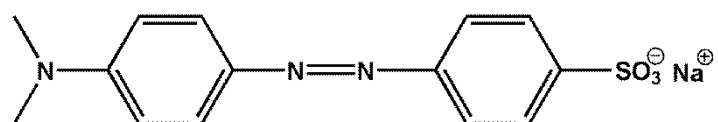
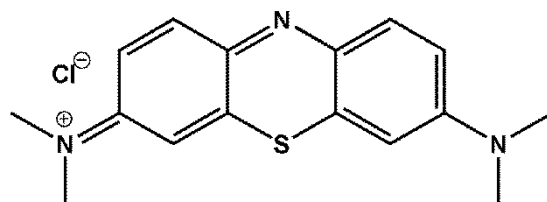


Fig. S4 Structure diagram of polymeric ionic liquids [PEP-MIM]DBS.



Methyl Orange (MO)



Methylene Blue (MB)

Fig. S5 The molecular structure of water-soluble dyes.

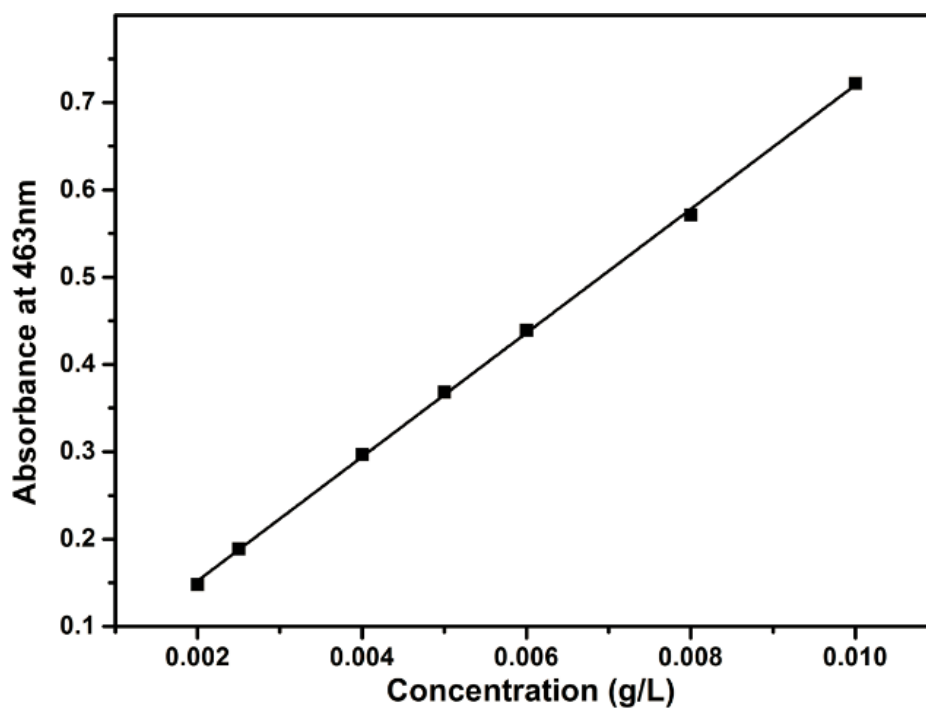


Fig. S6 The standard curve of methyl orange (MO) aqueous solution.

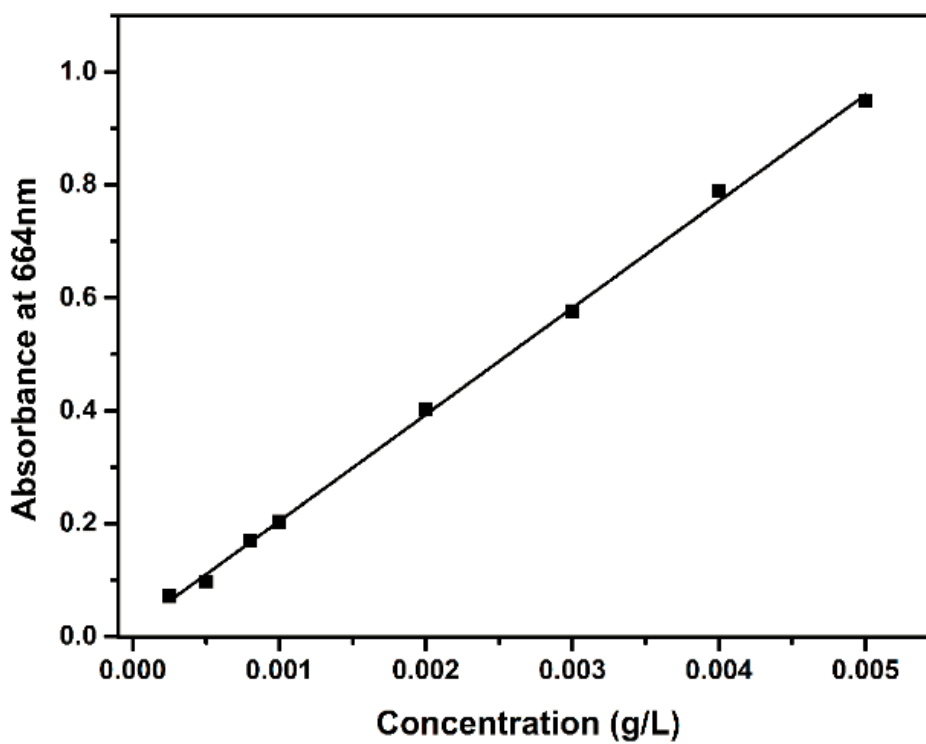
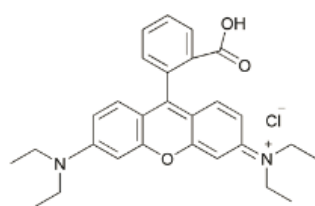
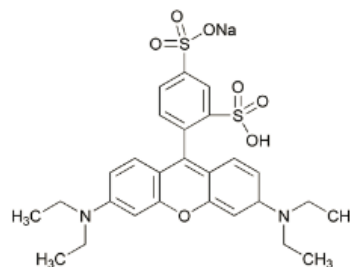


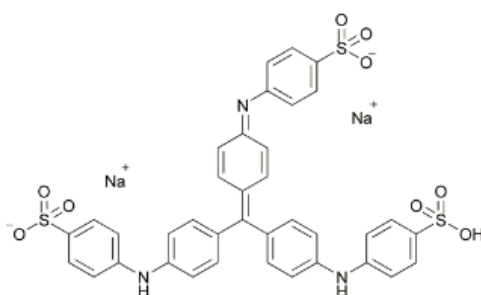
Fig. S7 The standard curve of methylene blue (MB) aqueous solution.



Rhodamine B



Lissamine rhodamine B



Methyl blue

Fig. S8 The molecular structure of three water-soluble dyes.

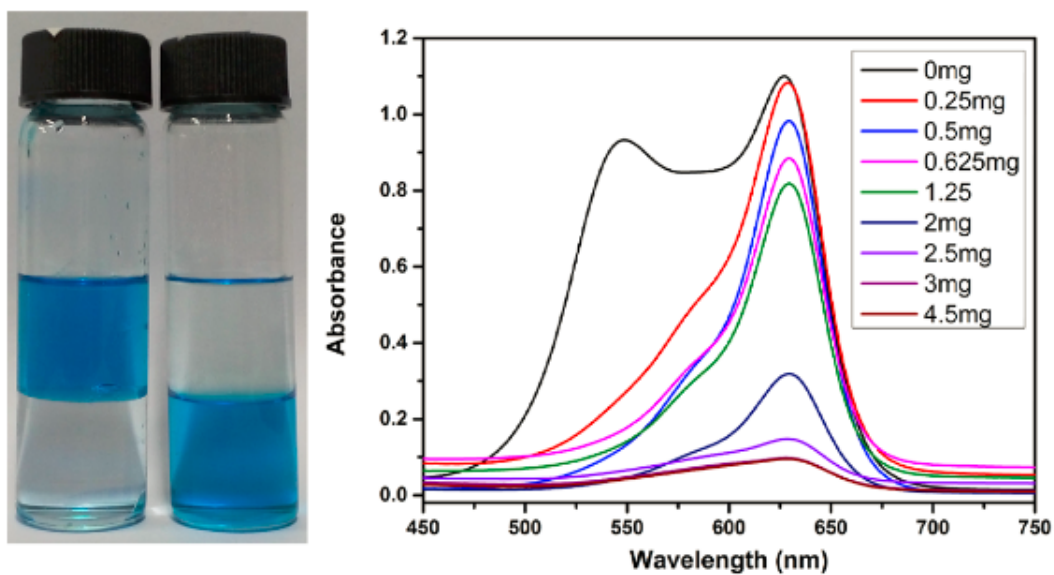


Fig. S9 The photograph of methyl blue phase-transfer in water/ CHCl_3 (left); UV-Vis absorption spectra of the aqueous solution of methyl blue contacted with different amounts of [PEP-MIM]DBS in CHCl_3 .

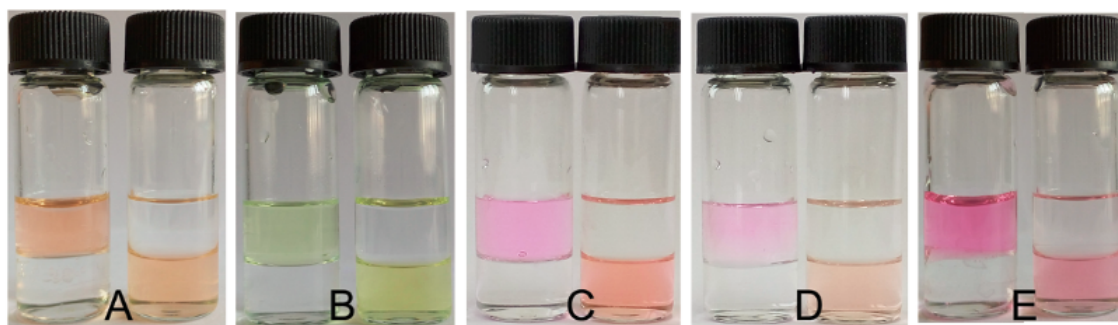


Fig. S10 [PEP-MIM]DBS as transporter for water-soluble dyes Red HA3689(A), Reactive light yellow M-7G (B), Lissamine rhodamine B (C), Rhodamine B (D) and Bright red 3BF in water/ CHCl_3 ; the bottle of each photograph was shown for comparison.

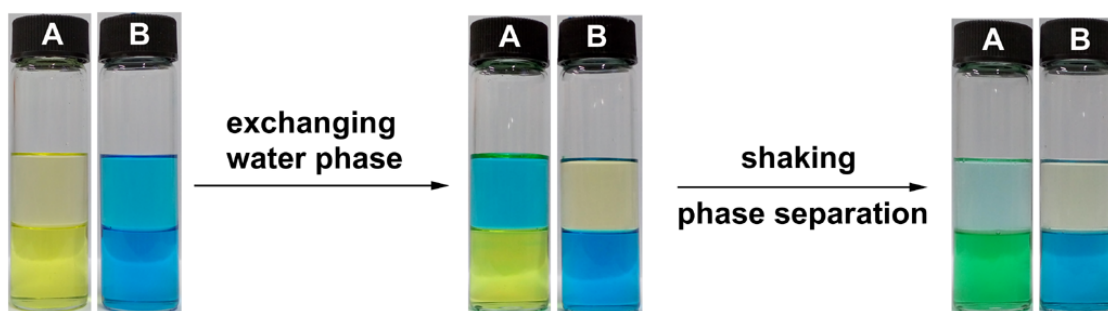


Fig. S11 Schematic diagram of experiment