

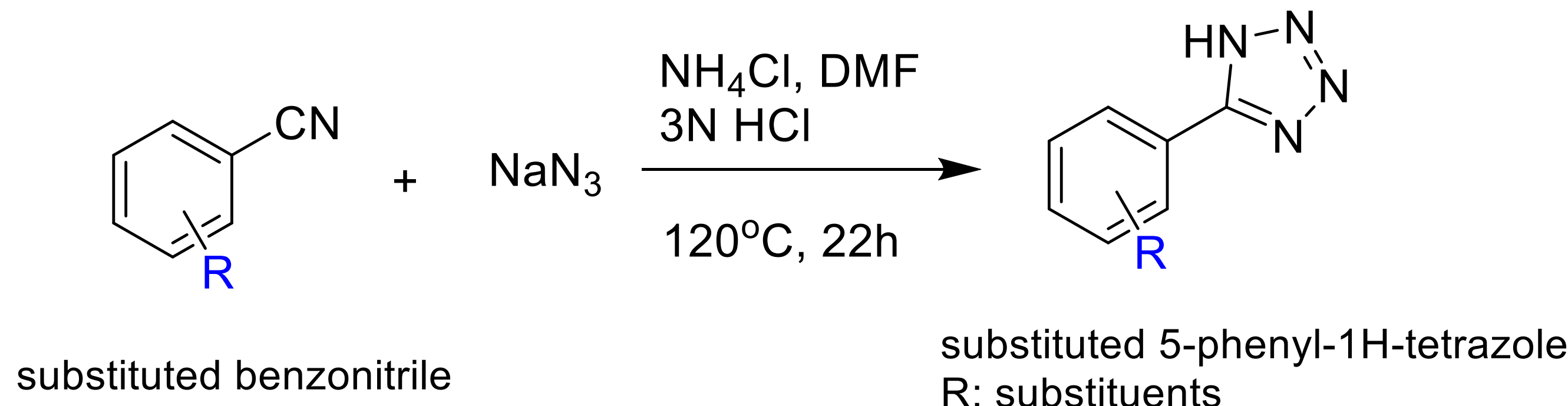


Structure-property relationships in new LCST ionic liquids

Sanskrita MADHUKAILYA, Leila MOURA, and John D HOLBREY

Synthesis & Methodology

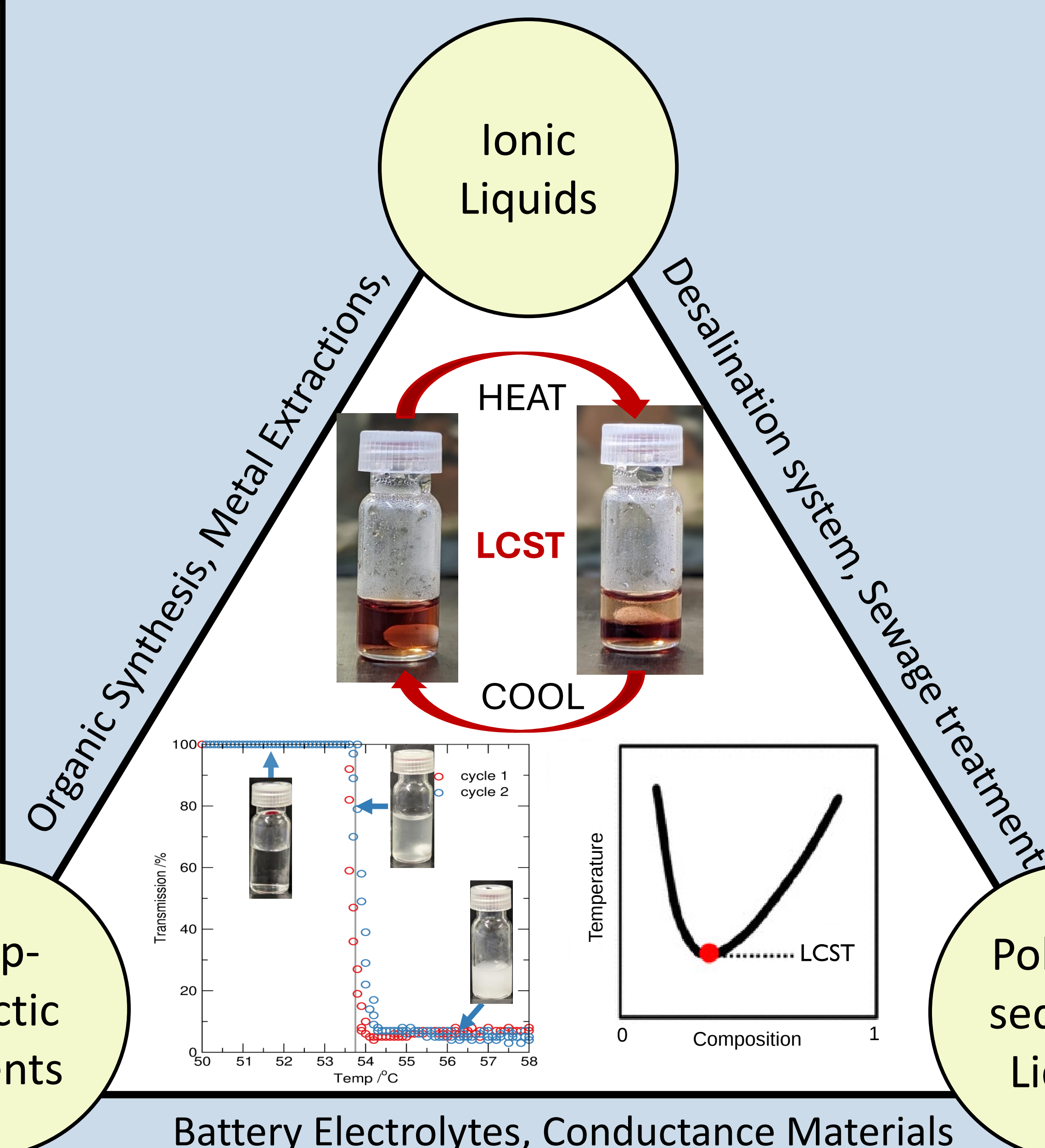
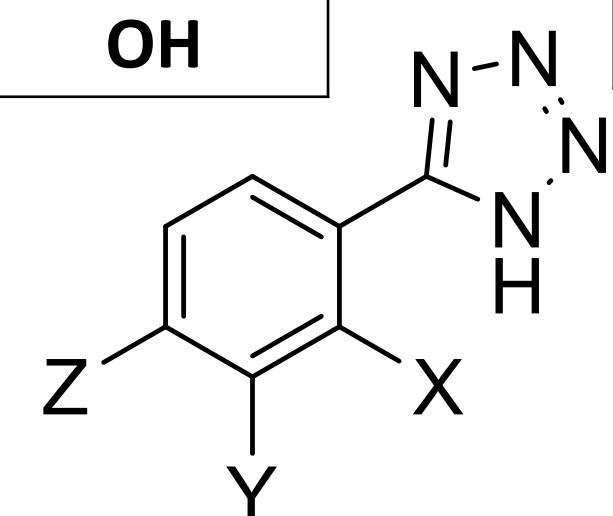
Cyclisation to tetrazoles



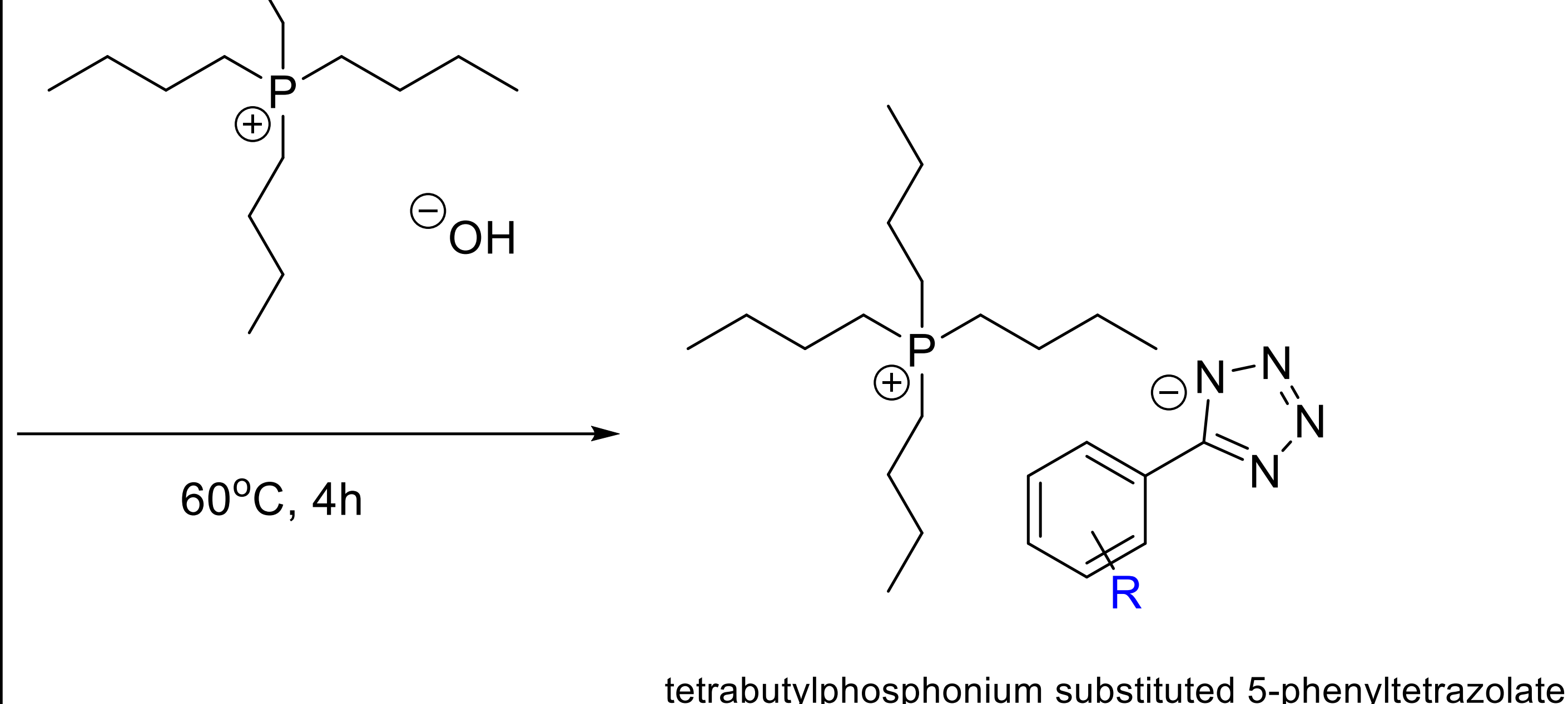
Anion modification

X	Y	Z
H	OCH_3	H
H	H	OCH_3
CH_3	H	H
H	CH_3	H
H	H	CH_3
H	H	C_2H_5
H	H	CF_3
OH	H	H
H	H	OH

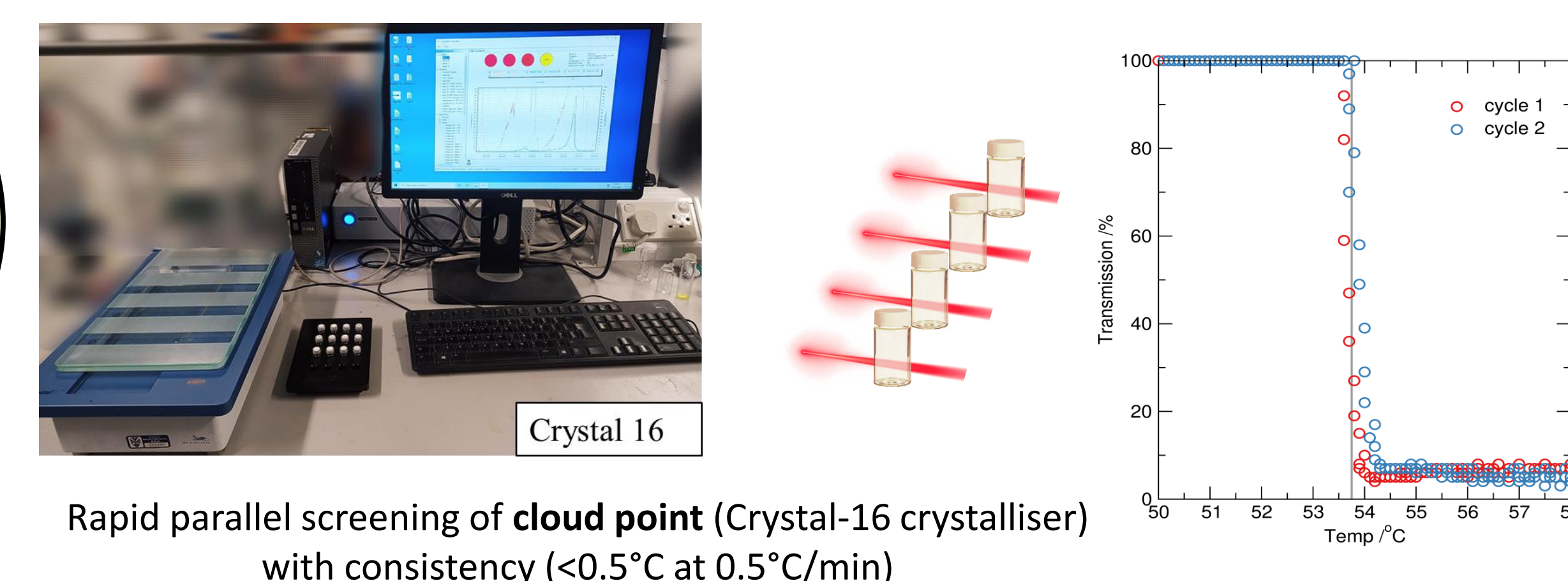
X	Y	Z
Br	H	H
H	H	Br
Cl	H	H
H	H	Cl
NH_2	H	H
H	H	NH_2
H	H	CF_3
H	H	NO_2
H	H	H



Forming the ionic liquids (ILs)



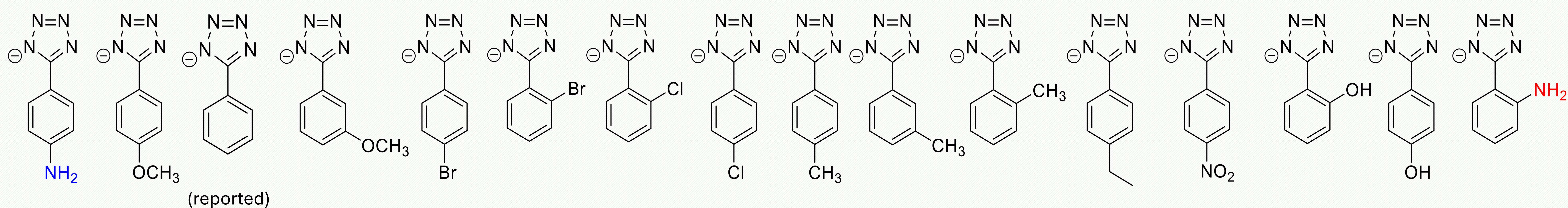
Testing the phase behaviour of IL/ H_2O mixtures



MISCIBLE

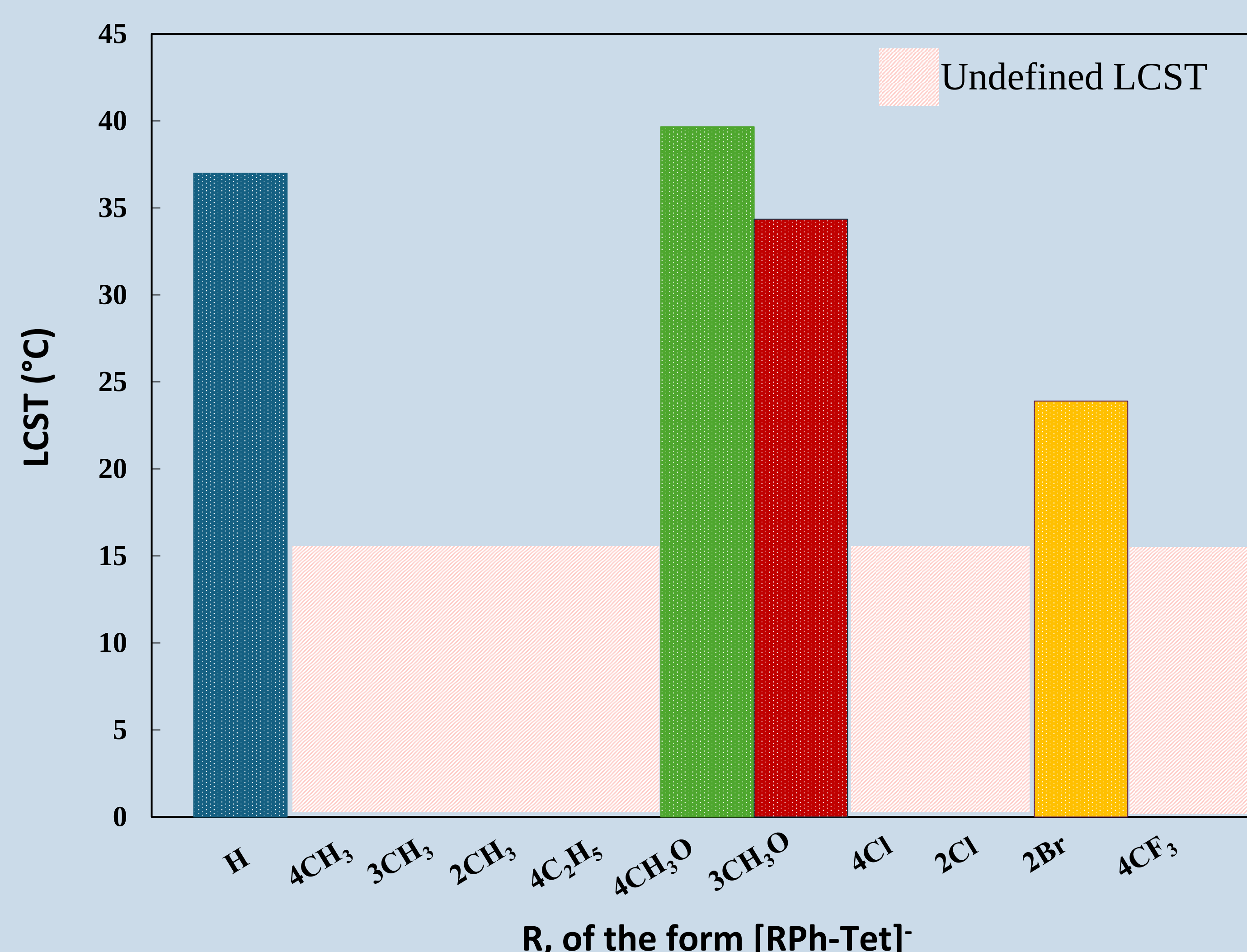
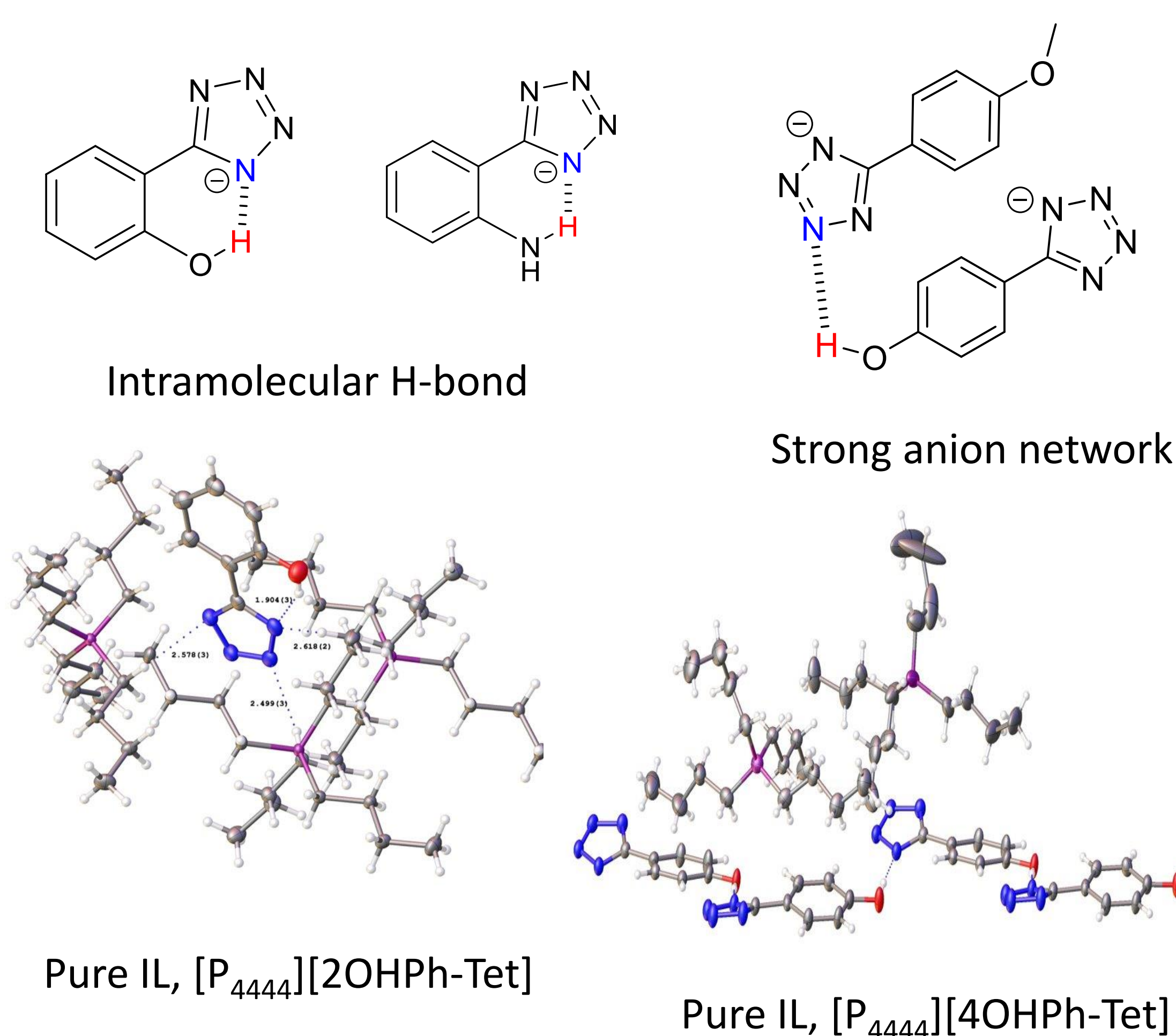
LCST

IMMISCIBLE

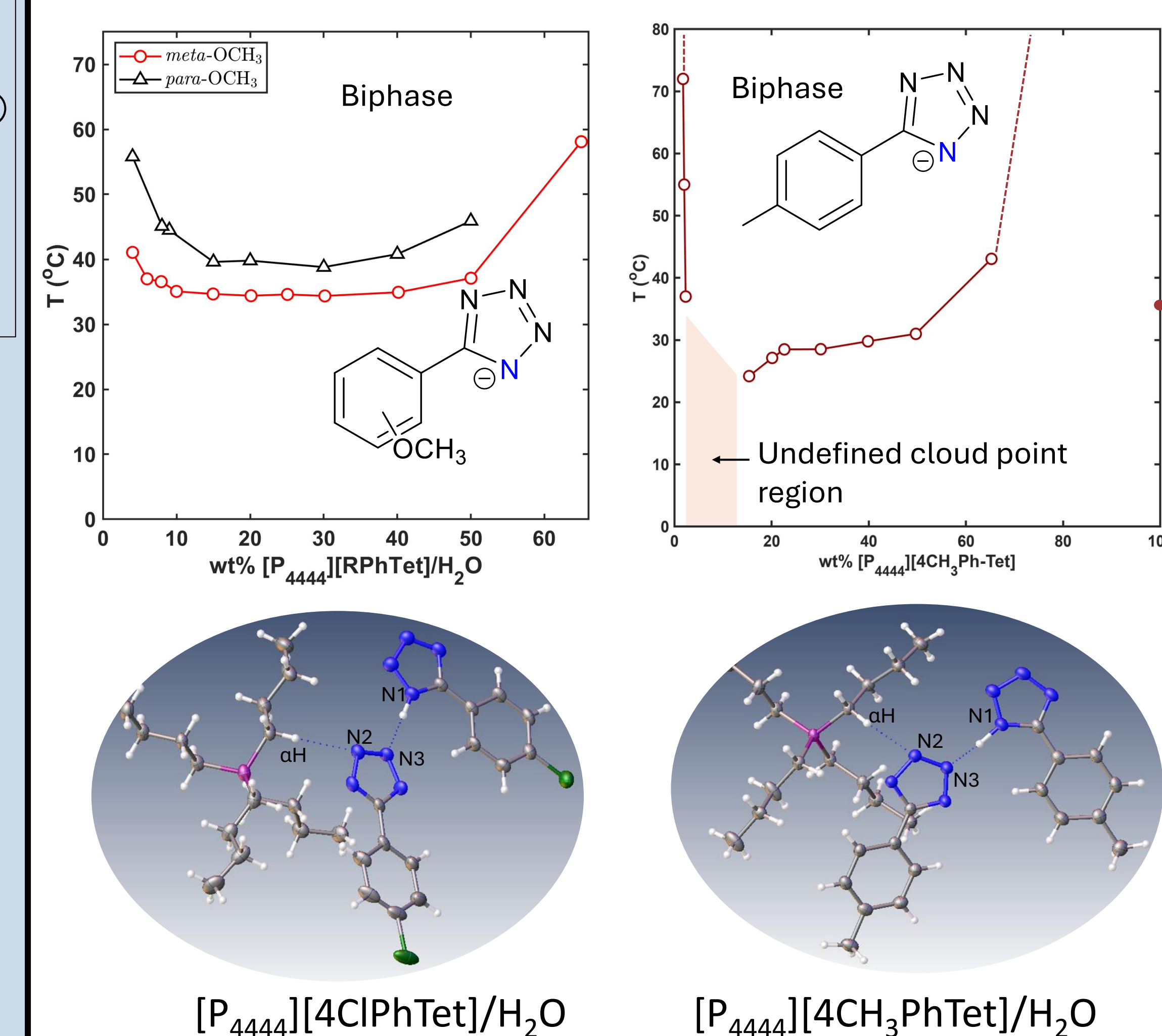


Observations & Conclusions

Non-LCST Systems



LCST Systems



Inter-ionic interactions involving the ionic liquid's anion imparting hydrophobicity

Inter-ionic interactions within the ionic liquid's anion and the ion-pair : acid-base system

Future Works:

- Comparative study on Dicationic Ionic liquids,
- Calculate Hydrogen-bond basicity/pKa/β-values for the anions,
- Thermo-responsive hydrogels and their perspectives in FO processes.

References:

- Moura *et al.*, *ChemPhysChem*, 2017, **18**(23), 3384-3389.
- Urban *et al.*, *Commun Chem*, 2019, **2**, 51.
- Cai, Y *et al.*, *Environ. Sci.*, 2015, **1**(3), 341-347
- Wilson *et al.*, *Chem. Commun.*, 2017, **53**, 10934
- Yu *et al.*, *RSC Adv.*, 2014, **4**, 14055-14062

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