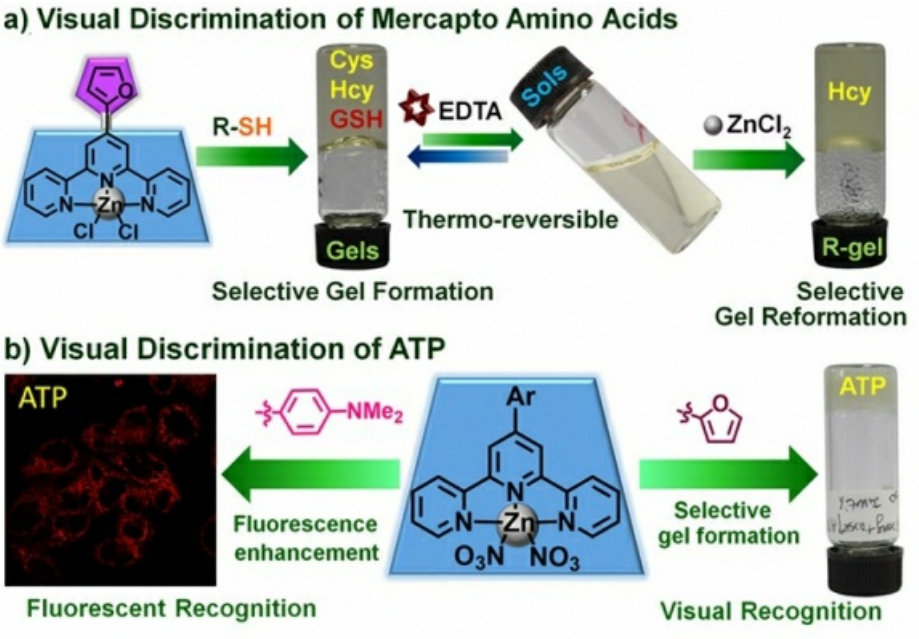
MS084.O02

Pincer molecular metallogels: A new platform for visual recognition

Tao Tu[1]
[1]*Department Of Chemistry, Shanghai, China*
E-mail: taotu@fudan.edu.cn

Currently, gels derived from discrete compounds have attracted increasing attention owing to their unique physical properties and various potential applications. Hydrogen bonding, π stacking, and van der Waals interactions are usually considered as pivotal driving forces for molecular assembly and solvent immobilization. Despite of the major role that organometallic compounds play in synthesis, catalysis, and material science, the investigation on metallogels has been somewhat neglected. Therefore, a verity of novel organometallic pincer complexes have been developed us and exhibited strong abilities to gelate a broad range of organic solvents, ionic liquids and even water to form robust useful gel-type soft matters at very low concentrations. Based on SEM, TEM, AFM, DLS, XRD, HR-MS, and rheology studies, the plausible molecular assembly mechanism for pincer organometallics were proposed. The control experiment of the metallogels phase alternation with a plethora of external ligand substitution or coordination geometry alternation further support that π stacking and metal–metal interactions along with hydrogen-bonding interactions between gelator and guest molecules are responsible for the gel formation. With this crucial control strategy in hand, the visual discrimination of chiral enantiomers, positional isomers, homologues, and even challenging bioactive substances have been realized via selective gel collapse and formation. Furthermore, in combination the self-healing properties and selective visual discrimination abilities of these thixotropic metallogels, novel multiple stimuli responsive molecular photo and chemo switches based on molecular metallogels have been realized. The potential application of these novel metallogels in catalysis is under the investigation in our laboratory.

[1] Fang, W. et al. (2016) ACS Appl. Mater. Inter. 8, 20583–20590;
[2] Tu, T. et al. (2013) Adv. Mater. 25, 5304–5313.
[3] Tu, T. et al. (2011) Angew. Chem. Int. Ed. 50, 6601–6605.



Keywords: metallogels, Pincer Complexes, Visual Recognition