

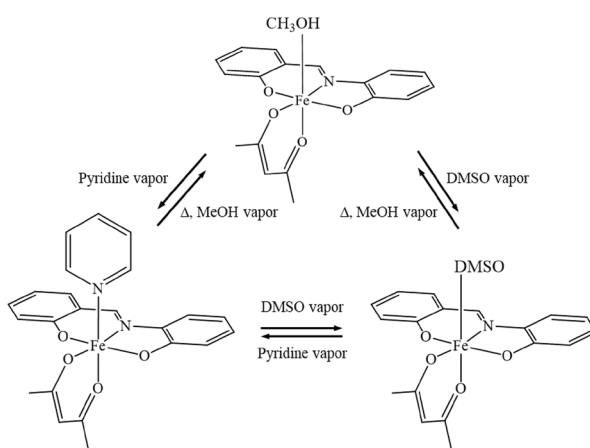
Reversible Polarity Switching Based on Solvent Ligand Exchange Reaction Triggered by Solvent Vapor

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The development of functional switching molecules that exhibit bistability with respect to ferroelectric, ferromagnetic and spin crossover (SCO) properties have attracted considerable interest for use in new functional devices that include memory devices and sensors. However, reports describing the switching of polarity are extremely limited compared to those describing the switching of magnetic properties. While such a functional switching system induced by absorption/desorption of guest molecules is an attractive candidate for use in the construction of molecular devices, the synthesis of new systems of this type clearly remains challenging.

In the present study, we have focused on investigating mononuclear complexes of type $[M(\text{sap})(\text{acac})(\text{sol})]$ ($M = \text{Fe}^{\text{III}}, \text{Al}^{\text{III}}$; $\text{H}_2\text{sap} = 2\text{-salicylideneaminophenol}$; $\text{acac} = \text{acetylacetonate}$) incorporating a substitution-prone coordination site. In this context it is well established that six-coordinated octahedral metal complexes in which a coordination site is occupied by a solvent molecule show a propensity for solvent ligand exchange with a second solvent having a higher coordination ability, giving rise to the prospect that polarity-dependent solvatochromism may occur. Herein, we demonstrated a solvent vapor-induced polarity switching involving mononuclear iron(III) complexes of type $[\text{Fe}^{\text{III}}(\text{sap})(\text{acac})(\text{sol})]$ ($\text{sol} = \text{MeOH}$ (**1**), DMSO (**2**), pyridine (**3**)) and aluminum(III) complexes of type $[\text{Al}^{\text{III}}(\text{sap})(\text{acac})(\text{sol})]$ ($\text{sol} = \text{MeOH}$ (**4**), EtOH (**5**), DMSO (**6**)): in each of these the coordinated solvent corresponds to a substitution prone coordination site.



1) F. Kobayashi, R. Akiyoshi, D. Kosumi, M. Nakamura, L. F. Lindoy, S. Hayami, *Chem. Commun.*, **2020**, 56, 10509–10512.