

Metallacyclodimeric Array Containing Both Suprachannels and Cages: Selective Reservoir and Recognition of Diiodomethane

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Abstract : Self-assembly of a series of ZnX_2 ($X^- = Cl^-$, Br^- , and I^-) with 2,3-bis(4'-nicotinamidephenoxy)naphthalene (L) as a new bidentate pyridyl-donor ligand yields systematic metallacyclodimeric unit, $[ZnX_2L]_2$. The supramolecule constitutes a characteristically stacked forming both 1D suprachannels and cages. Weak C-H $\cdots\pi$ and inter-digitated $\pi\cdots\pi$ interactions are main driving forces in the formation of both suprachannels and cages. The slightly different features between the suprachannel and cage have been investigated by 1H NMR and TG analysis, which solvent quantitatively exchange within only suprachannels. Photo-unstable CH_2I_2 molecules are stabilized via capturing within suprachannels, which is monitored by UV-Vis spectroscopy. Furthermore, the photoluminescence intensity, from the chromophore naphthyl moiety of $[ZnCl_2L]_2$, gradually decreases with the addition of CH_2I_2 . And washing off the CH_2I_2 by dichloromethane returned the PL intensity back to its approximately original signal.

Keywords : metallacyclodimer, suprachannel, $\pi\cdots\pi$ interaction, molecular recognition

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