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Molecular Engineering of Imidazo[1,2-a]pyridine into Dual-State Emissive (DSE) Materials for Sensing of Environmental Contaminants

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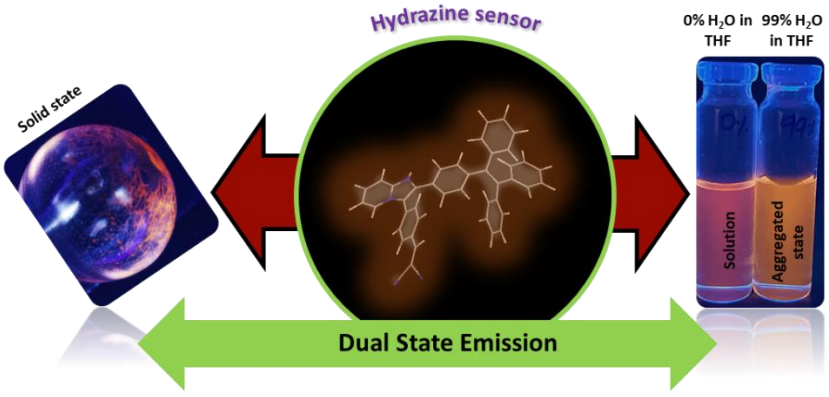
Abstract: Imidazopyridine constitutes an interesting class of heterocycles which are abundant in bioactive molecules as well as in several natural products.[1] The heterocyclic scaffold due to the π-conjugated bicyclic structure is fluorescent with excellent quantum yield in the solution state however is non-emissive in the solid state. Molecules which are weakly emissive or non-emissive in the molecular state but become highly emissive in the aggregated state are called Aggregation Induced Emissive (AIE) materials. Emission in solid state is generally observed with molecules comprising twisted molecular structure with rotor like geometry.[2] Despite significant advances in the development of emissive compounds, there has been an increasing quest in the past decade for materials where the emission is preserved in both states, dual-state emission (DSE). These compounds are expected to detonate a myriad of applications in the future. Considering the potential of the imidazopyridine scaffold, developing Imidazo[1,2-a]pyridine with dual-state luminescent properties can be of great interest. On this nascent topic, this work addresses a series of rationally designed π-expanded imidazo[1,2-a]pyridine derivatives showing dual-state emissive properties were designed whose sensing potential for sensing several environmental contaminants was investigated.



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