

Entropically Favoured Through Space Charge Transfer 'Lighted' Photosensitizing Assemblies for 'Metal Free' Regulated Photooxidation of Alcohols and Aldehydes

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Abstract : Strong acceptor-weak acceptor system FN-TPy has been designed and synthesized which undergoes solvent dependent self-assembly in mixed aqueous media to generate through space intermolecular charge transfer assemblies. The as prepared entropically favoured assemblies of FN-TPy exhibit excellent photostability and photosensitizing properties in the assembled state to activate aerial oxygen for efficient generation of reactive oxygen species (ROS) through Type-I and Type-II pathways. The FN-TPy assemblies exhibit excellent potential for regulated oxidation of alcohols and aldehydes under mild reaction conditions (visible light irradiation, aqueous media, room temperature) using aerial oxygen as the 'oxidant'. The present study demonstrates the potential of FN-TPy assemblies to catalyze controlled oxidation of benzyl alcohol to benzaldehyde and to corresponding benzoic acid.

Keywords : oxidations, photosensitizer, reactive oxygen species, supramolecular assemblies, through space charge transfer.

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