

A redox-active triazine framework for photocatalytic applications

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Covalent organic frameworks (COFs) represent an emerging class of semiconducting materials with high chemical stability, tunable optical properties and porosity that have demonstrated great performances in various applications. Triazine central cores have been established lately as versatile building blocks for the design and synthesis of such frameworks (CTFs) with molecular precision. We synthesized an organic framework through substitution of a triazine core with an aromatic nitrogen heterocycle under heating [1]. The resultant polymeric system has a π -stacked 2D sheets configuration, expanding perpendicularly to 3D structures. Its redox activity and semiconducting properties are evaluated through optical and electrochemical characterization techniques. The exposure of the CTF to UV irradiation at regular, timely intervals revealed a photo-induced electron transfer that is further confirmed by EPR measurements [2]. The generation of free-radical population with UV irradiation and more precisely the formation of superoxide and hydroxyl radicals are highlighting its efficient photocatalytic potential [3], [4]. These prominent results render this CTF a strong candidate in heterogeneous photocatalysis towards the reduction of CO₂ into valuable organic products by utilizing solar energy [5].

References:

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