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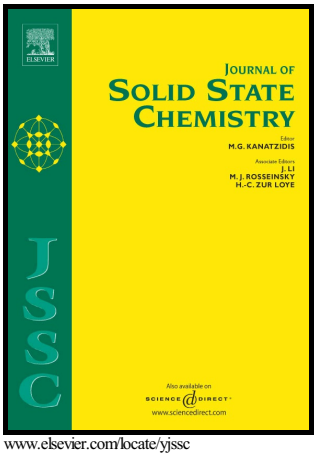


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# Synthesis of MIL-100(Fe)@MIL-53(Fe) as a novel hybrid photocatalyst and evaluation photocatalytic and photoelectrochemical performance under visible light irradiation

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## Abstract

The MIL-100(Fe)@MIL-53(Fe) was synthesized by the ultrasound method, while the initial solution for the preparation of the photocatalysts was included nanoparticles of MIL-100(Fe) and a precursor solution for the synthesizing of MIL-53(Fe). After an appropriate time of reaction, nanoparticles of MIL-100(Fe) were decorated on the surface of MIL-53(Fe). Phtoelectrochemical/electrochemical and photocatalytic degradation of methyl orange over MIL-100(Fe)@MIL-53(Fe) were explored. The phtoelectrochemical/electrochemical and photocatalytic performance of the prepared photocatalysts revealed that the introduction of nanoparticles of the MIL-100(Fe) on the surface of MIL-53(Fe) enhanced the photocatalytic performance of the resulted photocatalyst compared to pure MIL-53(Fe) and MIL-100(Fe). The enhanced photocatalytic efficiency is ascribed to increase the visible light region absorption and to decrease the electron-hole recombination rate in the hybrid photocatalyst. The present work demonstrated that the photocatalytic properties of metal organic frameworks (MOFs) can be improved by the fabrication of hybrid photocatalysts based on the different types of MOFs.

Graphical abstract: