Fe-based Metal-organic Frameworks for Highly Efficient Degradation Wastewater in Plasma/Fenton-like System

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July 30, 2020

Abstract

Fe-based metal organic framework (Fe-MOFs) was used as Fenton-like catalyst in dielectric barrier discharge (DBD) plasma/Fenton-like technology to treat wastewater, which solved the iron solubility problem. It was known that the valence state of iron will affect the catalytic performance, so the Fe-source precursor of FeSO4[?]7H2O was added to regulate the valence state to adjust the catalytic performance to improve the active site. The influences of discharge voltage, catalyst addition amount, H2O2 addition amount and pH on the degradation efficiency of methyl orange (MO) were systematically examined. Through free radical capture experiments, the reaction mechanism of the plasma/Fenton-like catalytic degradation process was deduced mainly as the coordinated oxidation process of hydroxyl radicals, photo-generated electron holes and superoxide radicals. The reusability experiments proved that the catalyst was stable and reusable. The possible degradation pathways were proposed based on the identification of intermediate products generated in the degradation process by LC-MS analyses.

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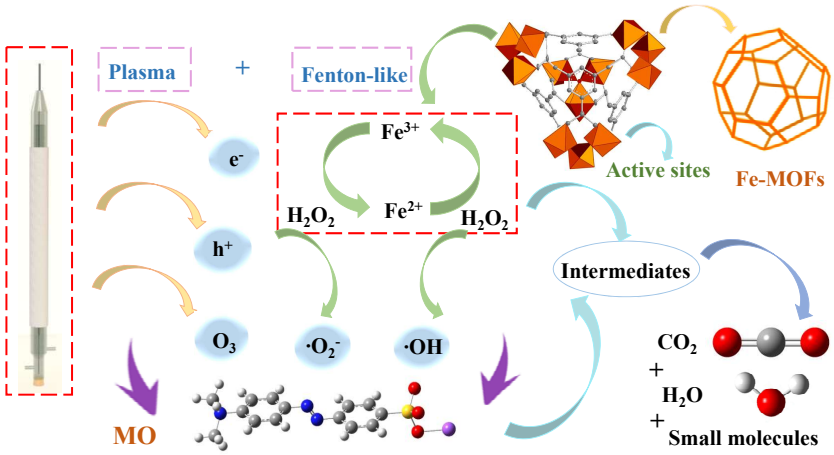

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