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Enhancement of Fenton Process Using High Entropy Alloy Powder as Catalyst

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Abstract

The Fenton process is one of the chemical oxidation degradation processes widely used in wastewater management due to being environmentally safe. The Fenton process is a reaction in which iron-catalyzed hydrogen peroxide to generate hydroxyl radical. Even though the Fenton process can degrade the azo dye solution, there are still substantial limitations, such as high sludge production and limited catalytic activity. This study focus on improving the azo dye degradation process in the Fenton process. Thus, a novel alloy material known as High Entropy Alloy (HEA) powder has been proposed for use as a catalytic material in the Fenton process. Mechanical alloying method was used to produce HEA

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powder, which is expected to considerably improve its efficiency in the degradation of azo dyes. The result shows the presence of HEA as catalyst improves the Fenton reaction by providing additional active sites. This research contributed to the development of an appealing, low-cost, and efficient approach for HEA functional applications in wastewater management. © 2023, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

Author keywords

Azo dye; Catalyst; Degradation; Fenton process; High entropy alloy (HEA)

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