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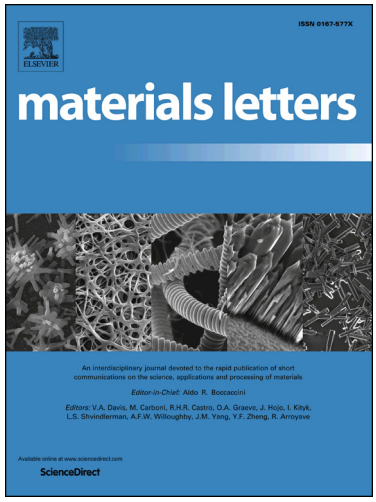

A novel application of Cu_2FeSnS_4 particles prepared by solvothermal route as solar photo-Fenton catalyst

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A novel application of Cu_2FeSnS_4 particles prepared by solvothermal route as solar photo-Fenton catalyst

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Cu_2FeSnS_4 (CFTS) particles were synthesized via a simple and versatile solvothermal route. The material was employed as a catalyst for the degradation of tartrazine dye from aqueous solution through the solar photo-Fenton process, reaching 95% of dye degradation at 50 min of reaction time. Powders containing a mesoporous structure with high surface area and total pore volume were obtained. The catalyst showed high chemical stability and degradation efficiency of tartrazine dye after five recycles. Therefore, CFTS shows intrinsic characteristics for potential application as a solar photo-Fenton catalyst in the tartrazine degradation from aqueous solution.

Keywords: Cu_2FeSnS_4, Solvothermal, Catalyst, solar photo-Fenton.

1. Introduction

Advanced Oxidation Processes (AOPs) are shown as a potential technology for the degradation of organic contaminants and disinfection of the effluents [1,2]. It is well know that AOPs are based on the generation of highly reactive radicals, as $HO^{\bullet}$, which can attack the pollutant molecules and subsequently leading to their degradation [3,4]. Among them, heterogeneous photo-Fenton process has been considered as a promising AOP [5]. This process is based on an electron transfer between hydrogen peroxide (H_2O_2) and iron-based catalyst under acidic conditions (pH < 4), which generates a great amount of $HO^{\bullet}$ radicals by catalytic decomposition [1,5]. Furthermore, the solar