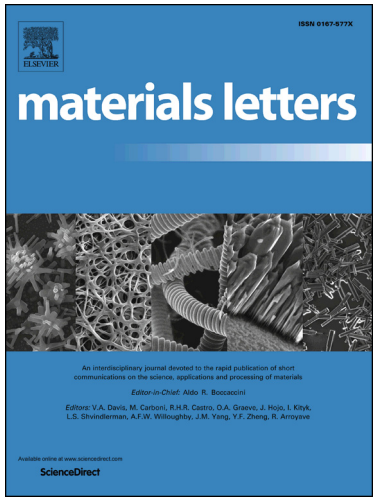

FeOOH Nanorods Array and Its Application in The Photoreduction of Cr(VI)

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FeOOH Nanorods Array and Its Application in The Photoreduction of Cr(VI)

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Abstract: FeOOH nanorod array was synthesized utilizing a facile hydrothermal method. The photoreduction efficiency to Cr(VI) is 70% after 4 h illumination at pH < 3. The Mott-Schottky plots confirmed the n-type behavior and the donor density is calculated to be 6.91×10^{16} cm^{-3}. The best anodic photo-current is 90 nA/cm^2 under illumination of light with intensity of 0.02 W/cm^2. The onset potential of photo-current is -0.2 V (vs. Ag/AgCl (Sat. KCl)), which indicates the FeOOH nanorods array has an active interface.

Keywords: Nanocrystalline materials; Nanoparticles; FeOOH; Photocatalysis; Cr(VI)

1. Introduction

The Cr(VI) treatment has been a global concern due to its high toxicity to the living organism [1-3]. In the various pollution treatment method, photocatalysis has been a powerful tool [4,5]. Searching for new photocatalysts with low price, easy operation and high solar energy utilization rate becomes a very hot topic. FeOOH, as one of the most stable coarse polymorphs of iron hydroxide, has aroused great concern due to its strong absorption ability to the visible light (the band gap is about 1.8 ~ 2.6 eV) [6]. The transformation of Cr(VI) to the less toxic Cr(III) by photocatalysis by FeOOH has been a hot investigation field [7-10]. The fabrication of the easy

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