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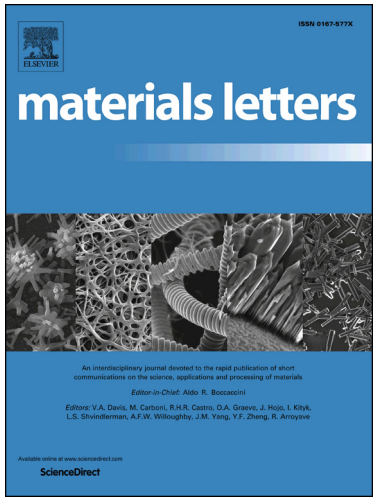

A novel coral rock-like ZnO and its gas sensing

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A novel coral rock-like ZnO and its gas sensing

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Abstract

In present work, a novel coral rock-like ZnO with porous structure was successfully synthesized via a solvothermal method and subsequent calcination. We were surprise to find that such ZnO nanostructure exhibited super high gas response to ethanol, which was attributed to the novel coral rock-like structure with porous nature, leading to effective gas diffusion and sufficient surface chemical reaction during sensing measurement.

Keywords: Functional; sensors; nanostructure; solvothermal

1. Introduction

Among the various metal-oxide materials, zinc oxide (ZnO) is one of the significant n-type semiconductor with a direct wide band gap energy of 3.37 eV, widely utilized in many fields, including sensors [1], solar cells [2], photocatalysts [3], varistors [4], etc. In recent years, considerable efforts have been devoted to the development of gas sensors based on ZnO nanostructures with various morphologies to realize the effective detection of certain gases. Up to date, ZnO nanoparticles[5], nanorods[6], nanowires[7], nanoplates[8], porous nanosheets[9] and etc. have been extensively prepared via diverse techniques. In particular, ZnO nanostructures with porous structure have attracted extensive attention due to their extremely high specific surface area beneficial to adsorption and desorption of gas molecules on the surface [10]. Guo et al. [11] synthesized flower-like hierarchical ZnO structures consisting of porous nanosheets which

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