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Abstract

Gas Sensing Using One-Dimensional (1D) DNA Templated Cadmium Sulphide Nanowire †

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One-dimensional (1D) nanostructured inorganic materials have generated increasing interest in recent years due to their use as transducers in gas sensors because of their large surface to volume ratio and extraordinary opto-electronic properties. The sensing of volatile organic compounds (VOC) is very important for environment and human safety [1]. The ability of semiconducting metal sulphide DNA-templated nanowires to act as a transducer in a gas sensor is due to the change in electrical conductivity of nanowires as a result of the interaction between the active sites of the nanowires' surface and the absorbed target gas [2]. DNA templated 1D Cadmium sulphide (CdS) nanowires are particularly suitable for this application because of their selectivity to VOC, chemical stability and their ability to operate at room temperature [3]. The λ-DNA templated CdS nanowires were synthesised by reacting an aqueous solution of λ-DNA with $Cd(NO_3)_2$ and Na_2S in solution. This produced smooth, uniform and continuous one-dimensional nanowires. The chemical composition, morphology, current–voltage measurement and the sensing response of the synthesized nanowires were determined. These nanowires have potential as an effective transducer for sensing ethanol.

References

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