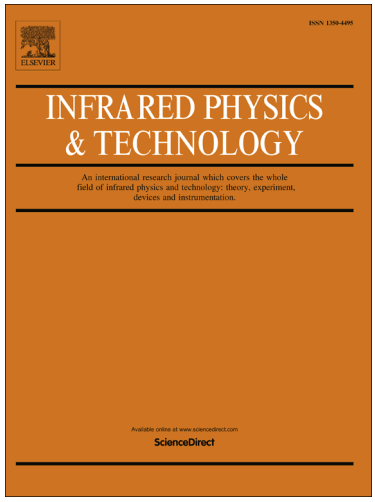

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ZnS Thin Films Grown by Atomic Layer Deposition on GaAs and HgCdTe Substrates at Very Low Temperature

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ABSTRACT

ZnS films grown on GaAs and HgCdTe substrates by atomic layer deposition (ALD) under very low temperature were investigated in this work. ZnS films were grown under several temperatures lower than 140 ℃. The properties of the films were investigated with high-resolution X-ray diffraction (HRXRD), scanning electron microscope (SEM), atomic force microscopy (AFM), and X-ray photoelectron spectroscopy (XPS). The results showed the ZnS films were polycrystalline. The growth rate monotonically decreased with temperature, as well as the root mean square (r.m.s) roughness measured by AFM. XPS measurement revealed the films were stoichiometric in Zn and S.

Keywords: atomic layer deposition, ZnS film, low growth temperature

1. Introduction

Atomic layer deposition (ALD) is a thin-film material growth technique that has potential in semiconductor device manufacturing [1-2]. The technique is capable of producing uniform thin films on high-aspect-ratio mesa structures, due to its advantages of atomic level controlled thin film deposition and self-terminating gas-solid reactions [3]. ZnS was one of

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