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1 A study of structural, morphological and optical properties of 2 nanostructured ZnSe/ZnS multilayer thin films

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9 Abstract

10 Nanostructured ZnSe/ZnS multilayer thin films with excellent blue
11 light emission were prepared using the electron beam evaporation
12 technique. The structures and crystallization of the nanostructured
13 ZnSe/ZnS multilayer thin films were studied by X-ray diffraction, which
14 revealed a good crystallization with cubic structure of ZnSe and wurtzite
15 structure of ZnS. The surface and inner morphologies of these films were
16 analyzed by the Scanning Electron Microscopic and Transmission
17 Electron Microscope, respectively. Optical transmission spectra were also
18 investigated by UV–vis–NIR scanning spectrophotometer. Furthermore,
19 the blue emission spectra of annealed films locating at about 440 nm were
20 obtained, which corresponded to near band-edge emission of ZnSe. An
21 obvious blue-shift of near band-edge emission was observed with
22 annealing temperature increasing due to the quantum confinement effects.
23 It is full of great potential for the nanostructured films to be used in
24 optoelectronic devices based on outstanding blue luminescence
25 performance.

26 **Keywords:** ZnSe, ZnS, Thin films, Nanostructure, Blue luminescence

27 1 Introduction

28 In recent years, II–VI semiconductors have attracted considerable
29 attention of researchers because of their excellent electronic and
30 optoelectronic properties, such as wide band gap, high chemical stability,

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