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# Morphology-Controlled Fabrication of ZnS Nanostructures with Enhanced UV Emission

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ZnS is well-known direct band gap II-VI semiconductor, and it attracts intense interest due to its excellent properties of luminescence which enable ZnS to have promising materials for optical, photonic and electronic devices. Especially, the emission wavelength of ZnS falls in the UV absorption band of most organic compoundsand biomolecules, thus it is envisaged that ZnS based devices may find applications in increasingly important fluorescence sensing. We have developed a facile and effective one-step process for the fabrication of single-crystalline and pure-wurtzite ZnS nanostructures possessing sharp band-edge emission at room-temperature having diverse length-to-width ratios. Each of nanostructures was composed of chemically pure, structurally uniform, single-crystalline, and defect-free ZnS. These features not only suppress trap or surface states emission centered at 420 nm, but also enhance UV band-edge emission centered at 327 nm, which give as-synthesized our ZnS nanostructures possible sharp UV emission at room temperature. The reaction medium consisting of mixed solvents such as hydrazine, ethylenediamine, and water as well as proper reaction time and temperature have played an important role in the crystallinity and optical properties of ZnS nanostructures. As-synthesized our ZnS nanostructures possessing sharp UV emission guarantee high potential for both fundamental research and technological applications.

**Keywords:** ZnS, Photoluminescence, One-dimension, Semiconductor