

Abstract Submitted
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Afterglow Study of ZnS:Cu,Co Water-soluble Nanoparticles and Potential Applications LUN MA, WEI CHEN — ZnS:Cu,Co water-soluble afterglow particles with average size of 4 nm have been prepared by using simple wet chemistry method. The X-ray diffraction pattern of the nanoparticles shows a cubic zinc blende structure as the synthesis temperature is low comparing with solid state reactions. The nanoparticles have two photoluminescence emission peaks. The blue emission is from sulfur defects (vacancies), while the green emission is from Cu^{2+} luminescent center which also contributes to the particle's afterglow. The presence of co-dopant Co^{2+} is critical to perform the afterglow of these nanoparticles. The afterglow intensity and decay vary on different Cu^{2+} and Co^{2+} doping levels. Further conjugation of ZnS:Cu,Co nanoparticles and photosensitizers presents a new method for deep cancer treatment in photodynamic therapy. The successful afterglow observation from water-soluble nanoparticles may find many new applications in biological imaging, detection and treatment.

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