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Blue Afterglow from ZnS:Ag,Co Water Soluble Nanoparticles
LUN MA, XIAOJU ZOU, MARIUS HOSSU, WEI CHEN, UT Arlington — Blue afterglow has been obtained from water soluble ZnS:Ag,Co nanoparticles by using a simple wet chemistry synthesis. The nanoparticles have a cubic zinc blende structure with average sizes of about 4 nm as determined by high-resolution transmission electron microscopy (HRTEM) and X-ray diffraction (XRD). The blue emission peaked at 441 nm is due to the transition from surface defects to Ag^{+} luminescent centers. However, the afterglow from ZnS:Ag,Co nanoparticles is centered at 475 nm. The presence of Co^{2+} is necessary to obtain the afterglow. The X-ray photoelectron spectroscopy (XPS) measurement indicates that oxidation occurred on the particle surfaces is also important. The blue afterglow ZnS:Ag,Co nanoparticles may open new applications in biological imaging, detection and treatment.

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