

# Ultraviolet-visible absorption behavior of ZnS nanoparticles at different synthetic origin

M. Habib Ullah, Tafazzal Hossain, Chang-Sik Ha

## Abstract

Sphalerite ZnS nanoparticles were synthesized from aqueous medium with three different ZnCl<sub>2</sub> concentrations. The particle sizes in solid form were found as 2- and 7-nm, that were determined by the X-ray diffraction and transmission electron microscopy analysis. We investigated the ultraviolet–visible absorption behavior of these nanoparticles with respect to the amounts of excess S or Zn at the surfaces in a particular dispersing agent, either ethanol or water. The surface analysis was carried out by the X-ray photoelectron spectroscopy. We observed tremendous variation of UV absorption only due to the variation of surface atoms, while particles in solid state were of same sizes and identical crystallinity. Moreover, we observed abrupt change of UV absorption of the nanoparticle systems when the dispersing agent is changed from ethanol to water, and vice versa.