

### Preparation of CuInS<sub>2</sub>/ZnS/Silica Nanocrystals for Application on white LED

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In this study, we synthesized the non-toxic and high efficient silica coated CuInS<sub>2</sub>/ZnS semiconductor nanocrystals(NCs), and applied the white LED phosphor. The quantum yield of CuInS<sub>2</sub>/ZnS NCs was over 60%, and the emission wavelength was tuned from 546 to 660nm by adjusting Zn ratio. The silica shell was formed by using surfactant templated silica coating method. The as-prepared hydrophobic CuInS<sub>2</sub>/ZnS NCs were transferred to the aqueous phase using cetyltrimethylammonium bromide (CTAB), and then TEOS was added to lead the hydrolysis reaction for shell growth. The detailed structural and optical properties of silica coated CuInS<sub>2</sub>/ZnS NCs were investigated by XRD, TEM, UV/vis, and PL.

The obtained CuInS<sub>2</sub>/ZnS/silica NCs were arrayed on GaN LED surface by Layer-by-Layer (LbL) self-assembly method based on electrostatic attraction. The fabricated CuInS<sub>2</sub>/ZnS/silica NCs phosphor layer was investigated by UV/vis, zeta-potential, and EL with increasing the layer number.