

Synthesis and characterization of ultra small PbS nanorods in sucrose ester microemulsion.

ABSTRACT

In the present study, we report for the first time the synthesis of ultra small PbS nanorods in a non-ionic sugar based water-in-oil (w/o) microemulsion system using food grade sucrose ester as surfactant. PbS was formed by mixing lead nitrate and thioacetamide in the water core of the microemulsion system. The as-prepared PbS nanorods were characterized by X-ray diffractometry (XRD), uv-visible absorption spectroscopy (UV-VIS), transmission electron microscopy (TEM) and X-ray photoelectron spectroscopy (XPS). The diameter of the PbS nanorods were found to be extremely small, which is in the range of 2.64 nm to 2.91 nm depending on reaction aging time. Spherical PbS nanoparticles were formed after 12 h and PbS nanorods were formed after more than 1 day of reaction aging time.

Keyword: Electron microscopy; Nanomaterials; Chalcogenides; Sucrose ester; Microemulsion.