TUNGSTEN OXIDE NANOPARTICLES PREPARED WITH SOFT TEMPLATING METHODS

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Abstract

Tungsten trioxide, WO_3, has been widely used to construct electrochromic windows, optical devices, gas sensors and as photocatalyst [1]. WO_3 has drawn more attention because of its high efficiency in photocatalytic degradation of organic compounds, including a large fraction of environmental toxins [2]. WO_3 is suitable for application in energy renewal, energy storage and environmental cleanup, using radiation in the visible spectral region [3]. In all of these applications, the morphological characteristics of the materials, like grain size or shape, are very important and depend strongly on the preparation method [3].

In this work, WO_3 nanoparticles were obtained by a soft templating method, using the aqueous nanocavities of AOT [sodium bis(2-ethyl-1-hexyl) sulfosuccinate] reverse micelles in cyclohexane (fig. 1).

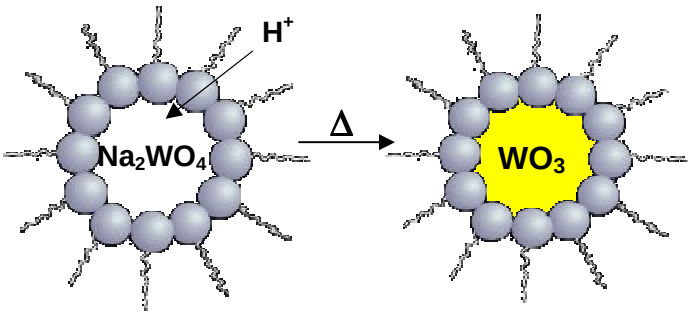


Fig. 1. Preparation method of WO_3 semiconductor nanoparticles.

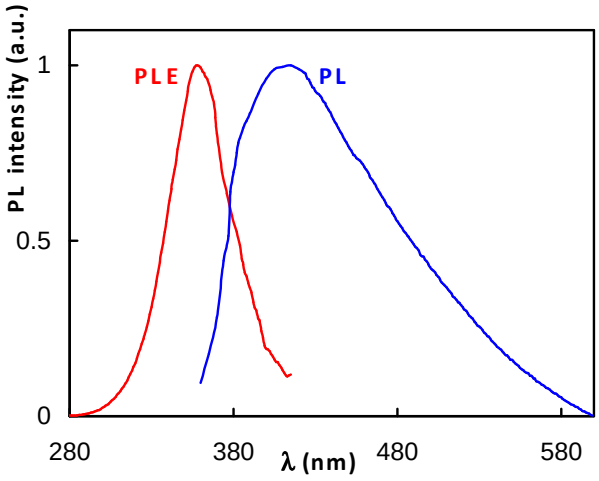


Fig. 2. PLE (λ_{em}=425 nm) and PL (λ_{exc}=360 nm) spectra of WO_3 nanoparticles.

The photoluminescence emission (PL) and excitation (PLE) spectra of the prepared WO_3 nanoparticles were measured (fig. 2) and compared with published data [4].

The prepared WO_3 nanoparticles were deposited in solid substrate by the Langmuir-Blodgett technique and were used in photodegradation assays of phenol.

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[3] N. Asim, S. Radiman, M.A.bin Yarmo, *Mater. Lett.* **61** (2007) 2652-2657.
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