

Transition Metal Dichalcogenide Nanotubes

Highly Aligned, Long Transition TMD Nanotubes

Overview

Transition metal dichalcogenide nanotubes (TMDNTs) have attracted significant attention in recent years as next-generation semiconductor materials, particularly for applications as transistor channels, optoelectronic devices, high-sensitivity sensors, and high-performance catalysts. Research and development is being actively pursued worldwide.

However, conventional synthesis methods continue to face challenges in achieving **uniformity, alignment, and long lengths, and consequently** have yet to deliver the expected material properties.

In this invention, we **successfully fabricated highly uniform, well-aligned, and long TMDNTs by using a crystal substrate with a small lattice mismatch**, epitaxially growing TMDNT precursors on the substrate, and subsequently subjecting them to sulfurization. The TMDNTs developed in this invention are expected to enable applications in next-generation semiconductor materials, sensors, and catalysts.

Application

□ Optical Sensors, Semiconductor Materials, and Catalysts

IP Data

IP No. : Not published

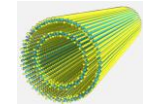
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Admin No. : HK26-001

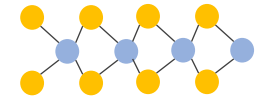
Background and Advantages of the Invention

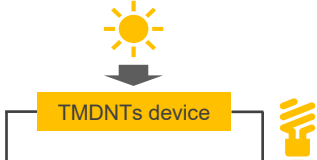
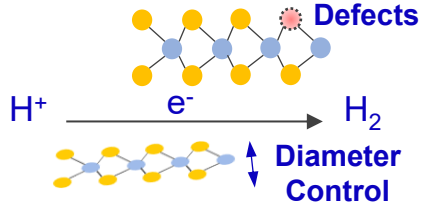
TMD nanotubes

- Tubular Transition Metal Dichalcogenides
- MoS_2 , WS_2 , MoSe_2 , WSe_2 ...

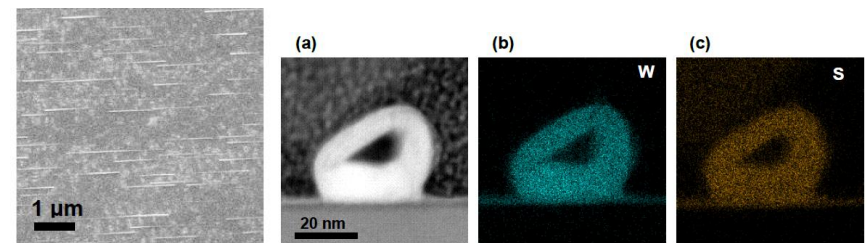


● Mo, W
● S, Se



Application	Conceptual Illustration	Advantages
Optical Sensor		Without a p-n Junction Bulk Photovoltaic Effect
Catalyst		Catalytic Performance Optimization Diameter, Strain, Composition, and Defect Parameters

Example



Successful Fabrication of Highly Aligned,
Long WS_2 Nanotubes Confirmed

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