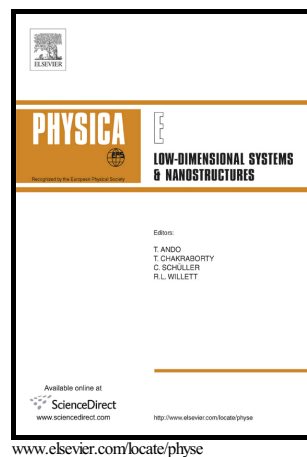


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# Synthesis of Boron Nitride Nanostructures from Catalyst of Iron Compounds via Thermal Chemical Vapor Deposition Technique

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## Abstract

For the first time, patterned growth of boron nitride nanostructures (BNNs) is achieved by thermal chemical vapor deposition (TCVD) technique at 1150 °C using a mixture of FeS/Fe<sub>2</sub>O<sub>3</sub> catalyst supported in alumina nanostructured, boron amorphous and ammonia (NH<sub>3</sub>) as reagent gas. This innovative catalyst was synthesized in our laboratory and systematically characterized. The materials were characterized by X-ray diffraction (XRD), Raman spectroscopy, Fourier-transform infrared spectroscopy (FTIR), Thermogravimetric analysis (TGA), Scanning Electron Microscopy (SEM) and Transmission Electron Microscopy (TEM). The X-ray diffraction profile of the synthesized catalyst indicates the coexistence of three different crystal structures showing the presence of a cubic structure of iron oxide and iron sulfide besides the gamma alumina ( $\gamma$ ) phase. The results show that boron nitride bamboo-like nanotubes (BNNTs) and hexagonal boron nitride (h-BN)

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