

# **Preparation of SiO<sub>2</sub> Nanowires from Abundant Residues and Their Characteristics**

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## **ABSTRACT**

The agricultural wastes have been studied to produce raw materials such as silicon dioxide and carbon. The amorphous silica (SiO<sub>2</sub>) and the carbon (C) have been prepared from rice husk, coconut shell and saw dust respectively via the appropriate treatments prior to the synthesis of SiC and SiO<sub>2</sub> nanowires. The silica was prepared from rice husk followed by successive characterization by the Scanning Electron Microscope and Fourier Transform Infrared Spectroscopy. It was investigated that the increase in the amount of acid in the precipitation of silica by acidification of the sodium silicate solution can modify the shape of the grain with the size was found to be about 5 μm. The formation of silica with the characteristic vibrations of Si and O bending was analyzed by using Fourier Transform Infrared Spectroscopy (FTIR). The formation of SiO<sub>2</sub> and SiC nanowires having diameter about 90 nm while the lengths were a few micrometers for the samples with rice husk and coconut shell (1:2) and rice husk and saw dust (1:2) were observed by the morphological characterization. The conductivity of SiO<sub>2</sub> and SiC nanowires formed on a Si-substrate was increased (decrease in resistivity) in the sample prepared with rice husk ash and saw dust charcoal (1:2). These SiO<sub>2</sub> and SiC nanowires prepared from the agricultural wastes could be used to fabricate small circuits in advanced technology.