

Article

Ethanol sensing property of SnO₂ quantum dots embedded on PVP

Choudhury M,* Nath S S,¹ Bhattacharjee R ²

*Dept of Electronics& Communication, NIT Silchar, Silchar-10, Assam, India *Dept of Physics,

Assam University, Schar-12, Assam, India

¹Central Instrumentation Lab, Assam University, Silchar

Silchar-12, Assam, India.

²Department of Physics, Assam University, Silchar

Silchar-12, Assam, India.

We prepare of SnO₂ quantum dots embedded in polyvinylpyrrolidone (PVP) matrix and report it's working as ethanol sensor. The samples have been prepared via quenching technique where bulk SnO₂ powder is sintered at very high temperature of 1000⁰C and then quenched into ice cold polyvinylpyrrolidone solution. The specimen have been characterized by using UV/VIS spectroscopy, X-ray diffraction study and high resolution transmission electron microscopy (HRTEM). These studies indicate the sizes of quantum dots to be within 10 nm. The prepared quantum dot samples have been examined for ethanol vapor sensing by exploring the variation of their resistance with time at different operating temperatures. It has been revealed that SnO₂ quantum dots can sense ethanol at low operating (200⁰ C) temperature with less response time & recovery time.

Keyword: Quantum dot, Sensor, acetone, polyvinylpyrrolidone, quenching.