



SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

Sree Sainath Nagar, A. Rangampet - 517102

**Department of Electronics and Communication
Engineering**

*Cordially invites you
to*

Expert Lecture

on

**"Working Principle of Magnetic Stirrer and Ultrasonicator and
their use for cleaning substrate and solution synthesis by
suitable precursor"**

08 February 2017

Resource Person:

Mr. S. Basha,
Technical Expert,
M/s Bross Scientifics, Tirupati

Date	: 08 Feb. 2017
Time	: 10.00A.M -04.00 P.M.
Venue	: 203 - National MEMS Design Centre
Target Group	: Students of M. Tech (VLSI) II sem. & III B.Tech (ECE)



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Program Details: Expert Lecture on, **"Working Principle of Magnetic Stirrer and Ultrasonicator and their use for cleaning substrate and solution synthesis by suitable precursor "**

Date of the Program: 03 March 2017

Organizing Department: Electronics and Communication Engineering

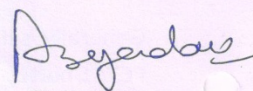
REPORT

Generally silicon substrate is used to fabricate the nanoelectronic high speed devices like FET, Shottky diode, MSM structure, MIM structure, MESFET etc. ZnO, SnO₂, Gallium nitride are used now a days to fabricate these devices because of their high band gap, high exciton binding energy and unique optical mechanical properties. This is the reason why these materials are overcoming the limitations of silicon in the field of optoelectronics and gas sensing applications based on Nanoelectronic devices. These materials are easily deposited on silicon substrate by number of techniques like Pulse Laser Deposition, Atomic Laser Deposition, Molecular Beam Epitaxy, Chemical Vapor deposition, Metal Organic Chemical Vapour Deposition, Plasma Enhanced Vapour deposition, Thermal Evaporation deposition, Electron Beam Evaporation, Thermal Evaporation, Solgel Spin Coating, Hydro Thermal Method etc. Among these methods Solgel Spin Coating method is suitable method for thin film preparation because of its low cost, large area deposition, easy doping, low temperature, etc. The equipment required for Solgel deposition of thin film are ultrasonicator, Magnetic stirrer, hot oven and spin coater. Ultrasonicator is used to mix the solution or dissolve the solution and also to remove the dust particles from the surface of silicon or other substrates. The ultrasonicator available in our lab is 2.5 Litre capacity and 2 KHz frequency. The usage of this instrument is demonstrated by expert team from Bross Scientific LTD.

He took 2 hours to install and demonstrate the ultrasonicator. This session was followed by a practical session in which they have demonstrated cleaning of the silicon substrate for dusty particle removal. In this process they had taken acetone in a beaker and placed the substrate on a Teflon stand. The Teflon containing substrate dipped in Acetone and placed in the ultrasonicator for 5-15 minutes. He demonstrated that removal of dust particle on the surface of silicon by ultrasonicator and proof of this was observed by us by investigating the substrate under the optical microscope.

The second device for the solution preparation for the solgel spin coating method is magnetic stirrer. The working principle of the Magnetic stirrer is magnetic field effect means north pole attract south pole. The building block of the Magnetic stirrer is a plate on which the beaker containing solution is placed and a changing magnetic field electro magnet is placed inside the equipment. When a magnetic bit is placed in beaker above the magnetic stiirer plate it experiences a force due to the electromagnet inside the magnetic stirrer. Due to this force this magnetic bit is bounded to the electromagnet and start rotating. when magnetic field changes in electromagnet because of electric current change the magnetic bit start rotating and dissolve the solute in the solvent.

There were number of queries solved by the expert regarding the speed control, material used, building blocks of the instrument and its maintenance.


Convener