

SREEPATHY INSTITUTE OF MANAGEMENT AND TECHNOLOGY (SIMAT)

Vavanoor, Palakkad - 679 533



Innovation & Entrepreneurship Development Cell



SIMAT/IEDC/2018/03

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National Science Day Celebrations 2018

Supported by Kerala State Council for Science, Technology & Environment (KSCSTE)

Industrial Visit to CMET (Centre for Materials for Electronics Technology)

As a part of National Science Day Celebrations, fourteen students from Departments of EEE & ECE and four faculties of SIMAT visited CMET on 28th February 2018. CMET is a research facility under the Ministry of Electronics and Information Technology, Govt. of India. CMET's R&D activities have been implemented in three laboratories at Pune, Hyderabad and Thrissur. Each of these laboratories has its own areas of specialization with requisite infrastructure and expertise. Thrissur Laboratory situated at Athani carries research on Electronic Ceramics, Microwave dielectrics, Multilayer Ceramics, Actuators and Sensors, Nano materials and thin films, Aerogels and Graphene super capacitors.

SIMAT team reached the facility at 10.30 AM. Dr. Murali K P (Scientist, CMET) welcomed and addressed the students. In his talk a brief overview of the research initiatives and the lab facilities available at CMET was explained. After the presentation in the conference hall, students were taken to different lab facilities. At first students were taken to the lab where research on transparent conductors and low cost PV cells using Kesterite which is abundant in earth. Next we visited CMET's research facility manufacturing super capacitors. Before entering the lab an overview of the super capacitor was provided. We were familiarized with the raw material used in the manufacturing process. First we were taken to the super critical drying chamber, a 10Cr machinery where aerogels are dried without deforming their micro pores. We got an opportunity to study about the new process used in drying materials. Also the PLC and supervisory control boards used there was a motivation for our students to study about PLC automation. Then we were taken to the Pyrolysis facility where the dried aerogels were processed at 1000 degree Celsius in inert atmosphere to remove the impurities present and to extract the carbon part. Next we were introduced to the mixing and calendaring machinery where the processed aerogel is bonded with a binder and drawn to a thin sheet of micro meter thickness. Then the thin film is bonded with aluminum foils using binding machinery where special type of chemicals is used under 180 degree Celsius. After that we were taken to the facility where these thin films are stitched to metal leads and rolled to make the anodes and cathodes of super capacitor. Several techniques like cold welding, stitching etc. are used for this purpose. Next we were taken to the testing labs where the different characteristics of super capacitors were

tested. Machineries to monitor charging/discharging the capacitor banks at different voltage levels at different pressure and temperature were shown and explained to the students.

Next we were taken to see the lab where fabrication of flexible PCBs with high dielectric constant (12-14), used in high frequency applications. We were introduced to an electron beam microscope which can magnify the surface up to one lakh times of its original size. The high di electric microwave substrates were developed using a process known as SMECH (sigma mixing extrusion calendering and hot pressing process), US patented by CMET. The process includes mixing, extruding, converting to thin film using calendaring method, removing impurities and hot pressing (200 ton press & 350 degrees) the material with imported copper clad.

SIMAT team left the facility at 12.30 PM. Mr. Sebin Sunny P (IEDC Nodal Officer), Santhi R (AP, ECE), Mr. Shibu K (Lab Instructor, EEE) & Hari C N (Lab Instructor, ME) accompanied the students to the research facility.





Sebin Sunny P
IEDC Nodal Officer
Sreepathy Institute of Management And Technology
Vavanoor, Palakkad – 679533
Mob: +91 9446870895