

Setting-up of Centre on “Development of fabrication facilities for optoelectronic devices based on molecular, polymeric and composite materials” at IIT-Guwahati.

List of Activities as per the approved Project indicating the Organization responsible for each Item:

(a) Synthesis of monomers, oligomers, polymers and hybrid materials for optoelectronic devices and fabricating devices. These include polyfluorene derivatives, polythiophene derivatives, naphthalenediimide and perylenediimide derivatives, zinc oxide-cadmium sulfide and their composites with graphene oxide etc. have been developed and characterized extensively.

(b) Setting up elaborate facilities to fabricate optoelectronic devices. This includes development of two laboratories primarily having prefabrication facilities for preparation of substrates and materials for device fabrication. The second major laboratory has all the state-of-the-art fabrication, characterization and testing instruments.

A state-of-the-art inert atmosphere glove box system was designed. This glove box is fabricated by the combination of three specially designed glove boxes inter connected with each other through large and small anti chambers and enable fabrication, deposition of organic, inorganic and composite materials and their electrical, electrochemical and optoelectronic characterization in-situ. This glove box has a spin coater, electronic balance, programmable baking plate, thermal evaporator and thickness monitor, solar simulator and IPCE, LED characterization system, I-V measurement system, cyclic voltammetry instruments prefabricated within the inert atmosphere of the glove box.

In addition the project also has a profilometer, probe station, laminar flow hood, ozone treatment system, vacuum oven, fume hoods, ultrasonication baths, Millipore water purification unit and quantum efficiency measurement system.

This complete laboratory was funded by Department of Science and Technology and is housed at the Center for Nanotechnology, Indian Institute of Technology Guwahati and has been named as “Center for Organic Electronics”. Several research scholars, Ph.D. students, Masters students (M. Tech. and M.Sc.) and bachelors students (B. Tech., B. S. and B.Sc.) are undergoing training on the development of organic and polymeric materials and their composites, fabrication of these materials into devices and testing their properties for light emitting, photovoltaic and transistor properties.





DST Sponsored Centre at IIT-Guwahati