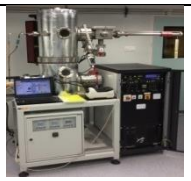
Mohanlal Sukhadia University, Udaipur

Thin Film Photovoltaic Laboratory, Department of Physics

EXPERIMENTAL FACILITIES

Equipment pictorial view at the site	Equipment name, make and model (Agency-project)	Applications
 	**Vacuum Coating Unit** (Thermal Evaporator, resistive heating) Hind High Vacuum SMART COAT 3.0 **(SERB-EMR)**	Coating of different layers to solar cells, Vacuum sealing of ampoules, annealing of thin film samples under vacuum and different environments upto 250°C. Coating of metal contacts to almost all type of solar cells like perovskite, organic, dye sensitized, CdTe, CIGS etc.
	**UV Vis. Spectrophotometer** SHIMADZU UV1780 **(SERB-EMR)**	To undertake optical properties of thin film and liquid samples like optical energy band gap, refractive index, extinction coefficient and absorption coefficient etc.
	**Spin Coating System** APEX spinNXGP1 **(SERB-EMR)**	Coating of different transport layers to solar cells through solution process spin coating route under different environments.
	**Source Meter** AGILENT B2901A **(UGC-MRP)**	To undertake electrical properties of thin films and devices.
	**Muffle Furnace** SONAR **(DEPARTMENT)**	Annealing of thin film and powder samples in air atmosphere upto 1100°C.
	**Ultra Sonication Bath** LABMAN **(RUSA-MHRD)**	To undertake cleaning of the substrates for thin film and device development.
 	**Magnetic Stirrer** LABMAN and Quantum Dot Development System **(RUSA-MHRD)**	To prepare different samples and to develop Quantum Dots for solar cell devices.
	**Hydrothermal Autoclave** TECHINSTRO **(SERB-EMR)**	To synthesize metal organic frameworks (MOFs) for storage devices and solar cell devices.

Equipment pictorial view at the site/ expected	Equipment name, make and model (Agency-project)	Applications
	**Solar Simulator** (Comprising of Xenon source, probe station, source meter etc) ScienceTech **(RUSA 2.0 R&I)**	To undertake current-voltage measurements followed by software driven performance parameters like short circuit current, open circuit voltage, fill factor, power conversion efficiency for substrate and superstrate architectured solar cell devices.
	**Vacuum Annealing System** Mansha Vacuum Equipments MVEVAS-2011 **(RUSA 2.0 R&I)**	To anneal thin film single layers and devices under vacuum conditions within temperature range upto 550 °C and vacuum level upto 10^{-3} mbar in order to prevent activation or treatment from the environmental constituents.
	**Hot Air Oven** Tempstar KL-103 **(SERB-EMR)**	To prepare and heat treat the samples in air ambient upto 250 °C temperature. Specially, it is applied to prepare metal organic frameworks (MOFs) and quantum dots to implicate these in solar cell and other optoelectronic devices.
	**Centrifuge Machine** Laby T-8M **(SERB-EMR)**	To prepare metal organic frameworks (MOFs) and other materials where the equipment is employed for centrifuging.
	**Fume Hood** To be purchased under RUSA 2.0 Research and Innovation Project	To clean the substrates for developing devices and the equipment is a basic facility in the wet Chemistry processes.
	**RF Sputtering System** To be purchased under FIST Physical Sciences Level C-Project	To deposit various single layers to the solar cell devices as per desired architecture where the system bears merits over the others as detailed in international panorama.
	**Electron Beam Evaporation System** To be purchased under FIST Physical Sciences Level C–Project	To deposit various single layers to the solar cell devices as per desired architecture where the system bears merits over the others as detailed in international panorama.

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