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Research Experience: 20+ years

Patents: Granted: 06 Applied: 02

Research Focus :

1. Polymers and Nanotechnology:

- Synthesis of Smart polymers, Shape memory polymers and Stimuli responsive (thermo-responsive, photo-responsive, etc.) polymers.
- Development of Mineral Trioxide Aggregates (MTA) for dental applications.
- Sol-gel, layer-by-layer (LBL), pechini processes for nanoparticle synthesis.
- Development of Phase Change Materials (PCM) and PCM containing polymers.
- Development of Polymeric foam (PU).
- Modifications of Thermoplastic polyurethanes (TPU) for matte-finish and flame-retardant applications.
- Polymer recycling, chemical methods – development of circular economy.
- Preparation and Characterization of Bio nanocomposites.
- Biopolymer development for bio-packaging applications.
- Bio-based plasticizer and other additives development.
- Reinforcing action of Nano-fillers for commodity plastics.
- Polyester and epoxy-based Pigment pastes for FRP Applications.
- Impact Modification of Engineering Polymers.
- Bio based filler like Lignin, Rice Husk and filled Polymers.
- Development of Thermoplastics Vulcanizates & Elastomers for Automotive Applications.
- Polymer processing, Rheological characterization of Polymers.

Interested Industry member kindly connect through:

Email Id: icc-industryacademia@iccmil.in

2. Surface Coatings and Resins:

- Synthesis of Newer resins from bio-based resources.
- Novel route of resin synthesis for substituting functional group in polymer backbone.
- Self-cleaning superhydrophilic, hydrophobic coatings development.
- Flame-retardant, intumescent coatings.
- Development of water based or VOC free coatings, waterborne polyurethanes and acrylic emulsions.
- Anticorrosive coatings for Industrial Applications.
- Development of hot-melt and pressure-sensitive adhesives.
- Rheological Characterization of Paints.
- Heat Reflective and Anti-Static Coatings.
- Decolorization of Shellac, Colour modification of fly ash.

Technology Licensed: NA

Technologies (Proof of Concept- POC): TRL level: 4

- Cellulose induces polyethylene films as an alternative to PET films: Circular economical aspect.
- Development of thermoplastic vulcanizates for automotive application.
- Development of high-end Resins or Adhesives from Heavies Stream.
- Development of Solvents Application in plasticizers, printing inks and industrial coatings.
- Development of Mineral Trioxide Aggregates.
- Chemical modification of guar gum as a paint thickener.
- Responsive Polymer Based Intelligent Devices (Magnetic nanoparticles).
- Development of polyamide based hot melt adhesives.
- Development of water based Associative Polyurethane Thickener.

Technologies under development:

- Development of biopolymer applications “Center of Excellence and Innovation (CoE&I)” For Biopolymer.
- Development of Phenol and phenolic glues for wood applications.
- Development of antioxidants for Polymers.
- Development of lignin based bio-adhesives.

Targeted Industries:

- FMCG.
- Automotive OEM.
- Resin manufacturers.
- Adhesive manufacturers.

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