Indian Institute of Technology Delhi

School of Interdisciplinary Research (SIRe)

SIRe Project Number

2023-01-02

(will be assigned by SIRe)

Project Proposal for Ph.D.

Project Details	
Project Title	Optically responsive cellulosic films for functional membranes
Project Summary (Minimum 500 and maximum 2000 characters)	Optically responsive films find applications in sensors, window panels, and for energy harvesting applications. Petroleum based fossil fuels are being used dominantly for fabrication of these membranes. The need of the society demands a paradigm shift towards using bio-based materials and replace non-renewable fossil fuel based polymeric materials. Potential extraction and use of cellulose from various sources not only reduce pollution but also generate green alternative to synthetic fossil fuel-based materials. This proposed project aims towards using cellulose-based fibers for fabricating optically responsive membranes and films. The optical properties of the formed films are to be tuned for achieving desired transparency and photon transfer efficacy. Such films are aimed towards developing potential packaging materials with controlled optical and photon transmittance properties.

Ph.D. Supervisors

Role	Faculty	Academic Unit in IITD/Institute/University	Email ID (Official)
Supervisor 1	Prof. Archana Samanta	Department of Textile and Fiber Engineering, IIT Delhi	archana@iitd.ac.in
Supervisor 2	Prof. Leena Nebhani	DMSE, IIT Delhi	lnebhani@mse.iitd.ac.in

Project requirements (Student qualifications, experience required, etc)

- M.Tech./B.Tech./M.Sc. in Chemical Engineering, Chemistry, Polymer technology

Source of fellowship/funding
(CSIR/UGC/DBT/ICMR/ICAR/NEET-PG/DST-INSPIRE/IRD/FITT Project details, if any)

Candidate with his/her own fellowship /institute assistantship

Role of Faculty Members involved:
Prof. Archana Samanta will be involved in optical properties development, Fabricating fiber based composites, establishing structure property correlation, and developing optically responsive membranes. Prof. Leena Nebhani will be involved in polymer chemistry, polymerization reactions and material development.