Indian Institute of Technology Delhi

School of Interdisciplinary Research (SIRe)

SIRe Project Number

2022-01-08

(will be assigned by SIRe)

PhD Project

Project Details	
Project Title	Biopolymer based nanocomposite coating for barrier applications
Project Summary	Surface energy and mesoscale surface roughness are two key attributes that determine surface wettability/lipophilicity. Further, gas and moisture permeability of a coating is determined by equilibrium solubility and transport diffusivity of the permeant (O_2, H_2O, etc.) across the coating. Finally, adhesion and uniformity of the coating on the substrate, an extremely important requirement, can be modulated by coating composition, its mesoscopic structure, and substrate surface modification. We intend to develop a coating solution for achieving target barrier and heat-sealing properties. Some of the key properties investigated will include, (a) structure and composition of deposited coating, (b) surface topography and adhesion/ uniformity on substrate, (c) barrier properties, (d) heat sealability, (e) surface energy (contact angle measurement for wettability and lipophilicity), and (f) scratch and abrasion resistance.

PhD Supervisors

Role	**Faculty**	**Academic Unit in IITD**	**Email ID**
Supervisor 1	Sudip K Pattanayek	Department of Chemical Engineering	sudip@chemical.iitd.ac.in
Supervisor 2	Rajiv Srivastava	Textile and Fibre Engineering	rajiv@textile.iitd.ac.in

Project requirements (Student qualications, experience required, etc)

- M.Tech./B.Tech. in Chemical Engineering, Food technology, M.Sc. in Chemistry
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Source of funding (IRD/FITT Project details, if any)

Institute Scholarship

Role of Faculty Members involved:

Prof Sudip will work on (a) structure and composition of deposited coating, (b) surface topography and adhesion/ uniformity on substrate (c) surface energy. Prof Rajiv will work on (d) barrier properties, (e) heat sealability, and (f) scratch and abrasion resistance.