TIFR Centre for Interdisciplinary Sciences
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Seminar

Smart Polymer Coating: Deigning of Anti-wetting Surfaces & Developing Stable Liquid Crystal Based Chemical Sensor

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Nature remains inspiration behind various interesting findings in literature and one of them is anti-wetting property that noticed in several living objects such as lotus leaves, rice leaves, butterfly wings, water strider legs etc. provides a platform to design materials for wide range of practical applications. Intense efforts have been directed toward the design of synthetic mimics of these materials for the design of self-cleaning surfaces, coatings that prevent corrosion or fogging, and advanced materials for water harvesting, oil-water separation, and a host of other emerging applications. A common approach to the design of synthetic superhydrophobic surfaces is one inspired by the natural structure of the lotus leaf, and generally involves the fabrication of surfaces with (i) appropriate combinations of microscale and nanoscale topography topped by (ii) a thin, low surface energy coating. While this approach is both useful and widely practiced, the practical utility of materials having this design is reduced in scenarios that expose them to physical insults (e.g., scratches) that can compromise low-energy coatings or physically degrade, remove, or destroy micro- and nanoscale surfaces features required to repel water and maintain non-wetting behavior. The pursuit of superhydrophobic surfaces that are physically robust and mechanically durable is a vibrant area of research and is important in both fundamental and applied contexts. Here, in my talk I will talk about how to design a robust and self-healing superhydrophobic coating based on three dimensional porous polymer coating and their several prospective applications such as drug delivery, guided water transfer etc. In second part of my presentation, I will talk about thermotropic liquid crystal droplets in context of sensing amphiphilic molecules. Liquid crystal droplet has immense prospect in sensing application-but at the same time, they are extremely sensitive, and they lose their property even after interacting with bare glass surface. Very Briefly, I will talk about how to decorating the thermotropic liquid crystal droplets with polymer assembly so that I can easily attach them on surface of various objects without disrupting their property.

Monday, Nov 10th 2014

4:00 PM (Tea/Coffee at 3:30 PM)

Seminar Hall, TCIS