Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad - 500107

Seminar

Carbon Dioxide (CO_2) Responsive Macromolecular Nanomaterials

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Increasing atmospheric concentrations of CO_2, a heat-trapping gas is pushing the world into a dangerous climatic condition. Reducing green-house gas emissions resulting from the combustion of fossil fuels requires new routes to capture and utilize CO_2. Furthermore, stimuli-responsive polymers have attracted significant interest due to their tremendous potential in various applications, such as controlled drug release and gene delivery, biomimetic materials, biosensors, intelligent coatings and smart surfaces or surfactants. This presentation will focus on the development of new amidine based CO_2 responsive macromolecular nanomaterials using RAFT based controlled polymerization techniques followed by room temperature post-polymer modification methods under atmospheric conditions. The new CO_2 responsive nanomaterials show high efficiency and selectivity for the capture and release of CO_2 under ambient conditions. The CO_2 fixing efficiency of the novel polymer from a dilute CO_2 source, such as a flue gas type mixture (20% CO_2, 80% N_2) was higher than the CO_2 fixing efficiency of previously reported amine and amidine based polymers from 99% CO_2 source. Further studies revealed that nano-structured polymer films developed from this material might have potential applications for reversible capture and release of proteins using CO_2 as reversible stimuli.

Tuesday, Oct 23rd 2018

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

Auditorium, TIFR-H