National Institute of Technology Rourkela

Synopsis Seminar

Seminar Title	: DIFFUSION DYNAMICS IN WEAK POLYELECTROLYTE SOLUTION
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Venue	: MC 126
Date and Time	: 22 May 2024 (10.30 AM)
Abstract	: Diffusion anomaly is accountable for molecular transport inside the living organism to which the transference of genetic materials, vital nutrients and ions around the cell membrane along with movement of drug particles are dependent. This simple looking well-ordered dynamic process in reality is based on complex mechanism. At a particular time, numerous parameters control the diffusion environment of real life system. And the simultaneous presence of these parameters turns the system into a macromolecular crowding where the own structural organization and other molecular interactions also influence the dynamical process. Normally, the controllable parameters affecting the diffusion process offer varieties of environmental constraints and in such situation, it is difficult to distinguish the exact parameter responsible for the analogous changes in the diffusion dynamics. For this reason, &ldquomodel systems&rdquo approach has been utilized as the alternative adaption to enhance the understanding the dynamics of the relevant systems. These model systems provide the freedom of choosing/selecting the individual parameters and tweak them to analyze the consequences on the diffusion process. Considering the above objectives, the focus of the current research work incorporates the weak polyelectrolyte solution as the model system to carry out dynamical study with varying controllable parameters as pH of the solvent, polymer concentration and external electrolyte concentration. Two oppositely charged weak polyelectrolyte systems of polyacrylic acid (anionic) and polyallylamine hydrochloric acid (cationic) are chosen as the model system to study their dynamical propoerties under set of controlled conditions using various experimental techniques like: Dynamic light scattering, Fluorescence recovery after photobleaching, and Rheology. The research works presented hereby is believed to contribute the basic understanding of real world systems to the scientific community and their functional performance in intricate surroundings. These studies will provide opportunities to conceptual design of matrices for appropriate applications comprising of controlled release systems with separation of matrices and scaffoldings for enzyme immobilization.