POLYELECTROLYTE COMPLEXES IN SEMIDILUTE SOLUTIONS

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Polyelectrolyte complexes (PEC) - products of the reaction between polyelectrolytes and oppositely charged species: macromolecules, colloidal particles, surfactant micelles. Generally, the reaction of complex formation is studied in dilute solutions, where PEC represent isolated particles of characteristic composition. In this lecture it will be shown that the formation of PEC is a powerful factor in the reversible regulation of the structure and properties of semidilute polyelectrolyte solutions.

Plan of the lecture.

1. Concentration regimes of polymer solutions. Features of the solutions of polyelectrolytes.
2. Experimental methods for determining concentrations of transitions: overlap (C*) and entanglements formation (Ce). Diagram of concentration regimes of polyelectrolyte solutions.
3. Overlap in solutions of associative polyelectrolytes.
4. Overlap in PEC solutions. The disappearance of semidilute unentangled regime.
5. The difference between the structure of PEC in dilute and semidilute regime.
6. Rheological properties of semidilute PEC solutions.
7. Phase separation in dilute and semidilute solutions of PEC.
8. Features of thermo-sensitive PEC of poly(acrylic acid) and polycations.
9. Rheological properties of semidilute solutions of thermo-sensitive PEC.