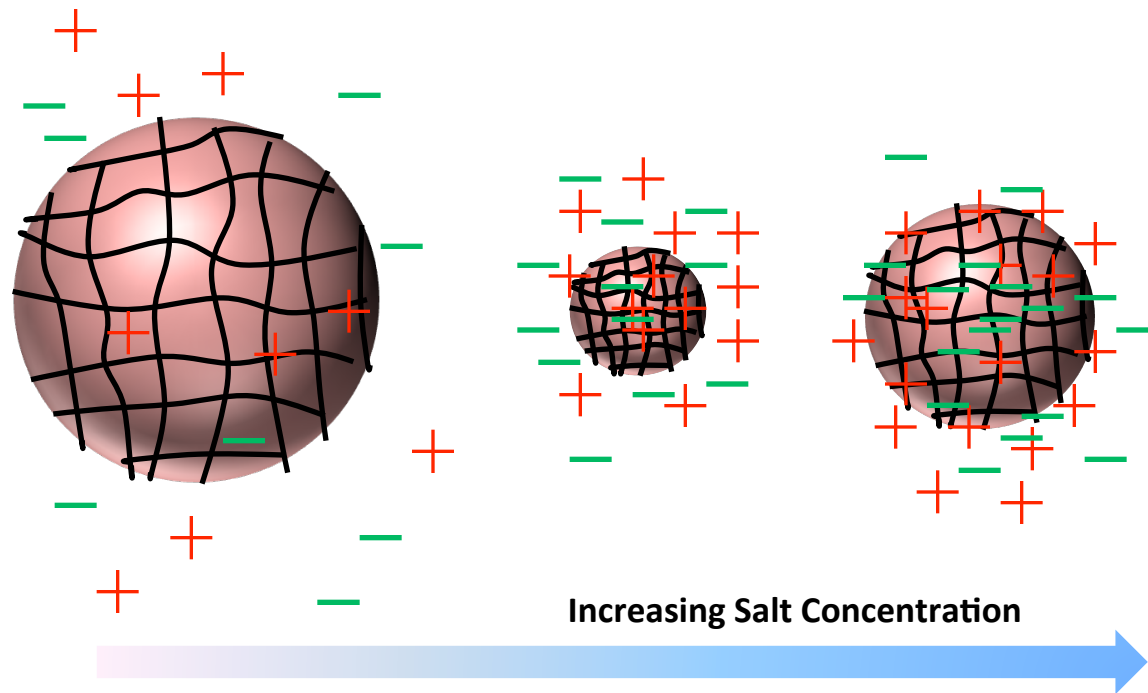


Understanding swollen–collapsed and re-entrant transitions in polyelectrolyte nanogels by a modified Donnan theory

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We propose a modified Donnan theory for studying the volume transition behavior of polyelectrolyte nanogels at high salt concentrations. Inclusion of the excluded volume effect of ions explains a re-entrant behavior; nanogels undergo a swollen–collapsed–swollen transition with increase in the salt concentration. The optimal compaction of nanogels can be controlled by the addition of a neutral component or by using a solution of monovalent and divalent salts. Effects of the dielectric mismatch on the swelling response of a nanogel in a solution of monovalent and divalent salts are analyzed.