Complexation of Polymeric Acids with Polymeric Bases

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Abstract
The complexation of poly(ethylene glycol) with poly(methacrylic acid) was studied in dilute aqueous solutions and in covalently crosslinked hydrogels. Complexation in dilute solution was detected by NMR relaxation time and Nuclear Overhauser Effect (NOE) experiments at lower poly(ethylene glycol) molecular weights than previously reported. NOE experiments revealed intimate contact between the ethylene groups of the poly(ethylene glycol) and the alpha-methyl groups of poly(methacrylic acid). The swelling of crosslinked gels containing covalently attached poly(ethylene glycol) and poly(methacrylic acid) was highly sensitive to pH, temperature, solvent type and network composition. Large transitions in swelling in response to changes in pH and solvent composition were observed, and these transitions were attributed to complexation and decomplexation induced by the changes in surrounding conditions.

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