

Non-monotonic swelling of surface grafted hydrogels induced by pH and/or salt concentration

Gabriel Longo, Monica Olvera de la Cruz, Igal Szleifer

Stimuli-responsive hydrogels display large-reversible volume changes in response to specific modifications in their environment. However, one of the most significant obstacles in developing hydrogel-based applications is the response-time, which is oftentimes prohibitively long. In the present study, we investigate the equilibrium response of a grafted hydrogel film composed of crosslinked polyacid chains when the pH and salt concentration of the bath solution are changed. Our results show that the pH-triggered swelling of the hydrogel film has a non-monotonic dependence on the acidity of the bath solution.

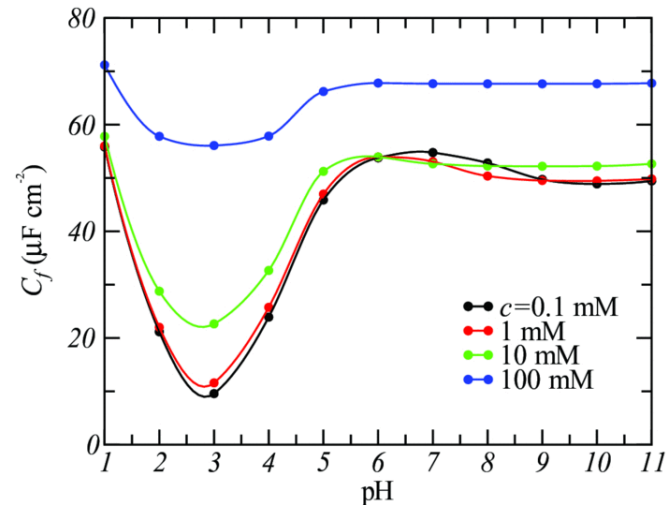


Fig. 1. The capacitance of the hydrogel film as a function of the pH at different salt concentrations.

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