

Effect of Divalent Cation on Swelling Behavior of Anionic Microgels: Quantification and Dynamics of Ion Uptake and Release

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Stimuli responsive microgels have been under strong focus for their promising use as sensors, filters, in several biomedical application and drug delivery systems.¹ Due to their peculiar soft and porous structure, extensive research has been done on their ability to uptake and selectively release drugs and proteins.² However, little interest has been shown for their responsiveness towards alkali ions, despite their fundamental role in biological processes such as muscle contraction.

Anionic ion responsive vinyl caprolactam (VCL) based microgels have been prepared and their behaviour towards alkali ions has been investigated in aqueous media. The gels are designed to be biocompatible and responsive to multiple stimuli, such as temperature, pH and metal ion concentrations.³ The gels have been synthesized by precipitation polymerisation and their structure, chemical composition and morphology were characterised. Their responsiveness towards temperature and pH has also been studied via dynamic light scattering (DLS), behaving in accordance to the literature. Their responsiveness towards alkali ions has also been investigated via DLS, and the quantification of ion uptake has been measured via Ion chromatography. Moreover, we present herein the dynamics of binding, which might play a determining role for future applications in synthetic biology.

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[2] W. Xu, A. Rudov, A. Pich, *Biomacromolecules*, **2019**, 20, 1578-1591.

[3] V. Chimisso, C. Fodor, W. Meier, *Langmuir*, **2019**, 35, 13413-13420.