Contribution ID: **60** Type: **Poster**

Crosslinking mechanisms in solutions of alginate-based graft copolymers with thermoresponsive side chains

Friday 6 December 2024 13:45 (3 hours)

Alginates are naturally occurring polysaccharides extracted from brown algae which are of interest for various biomedical applications[1]. In aqueous alginate solutions, divalent cations such as Ca can cause the formation of a polymer network due to the attractive ionic interactions between the cation and the negatively charged carboxyl group on the alginate chains. Grafting thermoresponsive side chains on alginate provides a second crosslinking mechanism, triggered by heating above the collapse temperature of the side chains[2]. In the present case, the side chains are random copolymers from poly(*N*-isopropylacrylamide) (PNIPAM) and the hydrophobic poly(*N*-*tert*-butylacrylamide) (PNtBAM)[3]. The present study aims to investigate the effect of these crosslinking mechanisms on the conformation of such alginate-based graft copolymers in dilute solution. Temperature-resolved dynamic light scattering experiments in the presence or absence of Ca were conducted to determine the hydrodynamic radius. In a dilute solution at room temperature, Ca is found to reduce the hydrodynamic radius of the graft copolymers via intramolecular crosslinking. The presence of Ca has no effect, neither on the collapse temperature nor on the hydrodynamic radius of the collapsed copolymer chains.

References
1. R. Abka-khajouei et al., Mar. Drugs 2022, 20, 364.
2. Y. N. Dahdal et al., Polymer 2016, 85, 77.
3. K. Safakas, C. Tsitsilianis et al., Int. J. Mol. Sci. 2021, 22, 3824.

Primary authors: PAPADAKIS, Christine (Technische Universität München, Physik-Department, Fachgebiet Physik weicher Materie); Prof. TSITSILIANIS, Constantinos (University of Patras); Ms SARAVANOU, Sofia-Falia (University of Patras); XU, Wenqi (Technical University of Munich, TUM School of Natural Sciences, Soft Matter Physics Group)

Presenter: XU, Wenqi (Technical University of Munich, TUM School of Natural Sciences, Soft Matter Physics Group)

Session Classification: Poster Session

Track Classification: Soft Matter