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## Structure of Composite Materials of pNIPAM Brushes and Magnetic Nanoparticles

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Polymer chains, grafted to a substrate by one end are usually referred to as polymer brushes (PBs). They are extensively used as thin surface coatings, enabling a tuneable film thickness, as well as high chemical and mechanical stability. Further, a high versatility arises due to the various monomers that can be utilized what may cause sensitivity to external stimuli, e.g. temperature or ionic strength [1].

Since their first description and experimental realization, the range of possible shapes and applications has been growing fast and is still expanding [2]. Apart from the interesting intrinsic properties, PBs are a suitable matrix for the attachment of additional components like nanoparticles or other functional materials. In the last few years, the focus shifted more towards the interplay between PBs and other materials in order to generate specific features, like on-demand drug delivery or sensing [3].

In this work, the adsorption behaviour of citric acid capped magnetic nanoparticles (MNPs) at poly(N-isopropyl acrylamide) brushes is investigated. The MNP concentration as well as the pH value during the adsorption are varied to control the loading of the PBs with MNPs. In order to localize the MNPs at the PB, the structure of the composite material is characterized with neutron reflectometry.

[1] S. Christau et al. *Macromolecules*, 2017, 50, pp. 7333-7343

[2] W. Chen et al. *Macromolecules* 2017, 50, pp. 4089-4113

[3] W. Górka et al. *Nanomaterials* 2019, 9(3), 456

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