# Chitosan-based microgels: Elaboration of a model soft-colloid with controlled microstructure.

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Over the last two decades, bio-based soft colloids have received a lot of attention, especially polysaccharide-based microgels [2]. However, controlling their microstructure at different scales to evaluate systematically theirs rheological properties remains virtually unexplored. challenging. Nevertheless, their different architectures offer many bio-based alternatives to tailor the flow properties of the complex fluid [1]. In case of microgel, a free-defect structure, so-called "model", means a homogenous crosslink density, without "loop" and free dandling chains, and a narrow distribution in size.

In this work, we aim to synthetize controlled chitosan-based soft colloids to investigate extensively their structure and their rheological properties in aqueous suspension. To do so, chitosan was chosen due to its versatility for chemical modification and as a semi-rigid biopolymer (persistence length from 8 nm [3]) which may provide a unique semi-rigid microgel.

Firstly, a strategy based on thiol-ene crosslinking chemistry [4] was optimised at macroscale to evaluate rheological properties of chitosan-based hydrogels prepared at different concentration. Then, the optimal synthesis conditions have been transferred at microscale ina in a water-in-oil emulsion, to produce chitosan-based microgels. Finally, there physical-chemical properties will be studied in water using rheology, scattering techniques and microscopy.

**Keywords:**
Microgels model, Chitosan, Thiol-ene, Soft-colloid

**References:**

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