

# Supporting Information: High throughput generation of emulsions and microgels in parallelized microfluidic drop-makers prepared by rapid prototyping

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# Microfluidic Emulsification and Microgel Preparation

The continuous phase for the emulsification experiments is composed of paraffin oil (50 %) and n-Hexane (50 %) containing 8 wt% of Span 80 as a surfactant. The mixture is stirred vigorously to obtain a homogeneous solution. To reduce dust and remove potential non-dissolved components the mixture is filtered through a 450 nm PTFE filter prior to use.

For the emulsification experiments we apply deionized water with a few drops of blue ink to color the aqueous phase for imaging.

For the microgel formation we prepare an aqueous 10 wt % solution of 6 armed starPEG gel-precursor. (The precursor is prepared according to a procedure well established in the literature. In short sorbitol core is used as an initiator, from which ethylene oxide and propylene oxide is polymerized in a (80:20) ratio by anionic polymerization using KOH as base. The molecular weight of the starPEG molecule is 18 kDa. The OH terminated starPEG molecules are functionalized with an excess of acrylic acid anhydride to obtain the final 6-fold acrylate terminated starPEG gel-precursor.) We add 4 wt % of hydroxyl-4- $\ddot{N}$ -(2-hydroxyethoxy)-2-methylpropiophenone as a photo-initiator to the aqueous starPEG solution and stir the mixture vigorously to obtain a homogeneous solution, The mixture is filtered through a 450 nm PTFE filter prior to use.

Monodisperse PEG-Acrylate microgels are synthesized by emulsifying the aqueous phase in the oil mixture using the described parallelized microfluidic devices. To initiate the reaction the emulsion is exposed to UV light of 380 nm (25 W) while flowing through polyethylene tubing leading away from the microfluidic device and into the collection vessel. The obtained crosslinked starPEG gels are collected and purified by adding butanol and centrifuging the microgels. Repeated redispersion and centrifugation using butanol and then water leads to the aqueous solution of large microgels.

All chemicals except the starPEG precursor are purchased from SigmaAldrich. The starPEG precursor was supplied by CHT R. Breitlich GmbH.