**Continuous Synthesis of Polymersomes in Micromixers**

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In the field of nanotechnology, the interest in producing well defined nanoparticles is still growing. Because of their huge surface area compared to their size, the applications of these nanoparticles range from nano reactors, drug delivery to surface modifications.

The preparation of block-copolymer vesicles with narrow size distributions is often connected with a time consuming and multistep synthesis. In contrast, we achieved continuous and controlled synthesis of these nanoparticles by using micro mixers with different mixing geometries. By additional parameter adjustment the size range of the synthesized polymer vesicles can be varied between 45 and 120 nm in diameter. The successful continuous synthesis of the polymer nanoparticles was verified by DLS and TEM characterisation of the obtained structures.

Further hydrophilic core and hydrophobic shell loading of the vesicles with dyes like phloxin B or nile red using micro mixers was successful and the resulting loaded vesicles can be used as a model system of drug encapsulant, paving the way for their use as pharmaceuticals. [1]

More precisely, the nanoparticles used in this study are based on the self-assembly of an amphiphilic block-copolymer (e.g. PB₁₃₀-PEO₆₆-OH/COOH) in selective solvents such as water with THF as co-solvent. [2] Due to variation of the mixing parameters, not only vesicles were obtained but also spherical micelles, cylinders or disc-like polymer nanoparticles. By analysing the obtained structures under defined mixing conditions, the mechanism of the self-assembly process could be investigated and different intermediates in the polymer vesicles formation were identified.