

Synthesis of nanoparticles and following fractionation by preparative gel electrophoresis

Monodisperse nanoparticles with **uniform properties** regarding **size and morphology** are essential already today for optical (plasmonic) applications, *self-assembly processes* etc.

On the focus of recent research, the fractionation of synthesized nanoparticles is investigated (s. Abb. 1). For this purpose the gel electrophoresis should be used in this project, which can separate particles due to **different electrophoretic mobilities μ_E** .

Therefore, nanoparticles are synthesized with different sizes and morphology (s. Abb. 2) and are characterized with DLS SAXS and TEM. Hereafter, the particles can be functionalized with ligands or the gel can be passivated by additives to realize a **higher separation precision** and to take influence at the **elec. mobility μ_E** . In the end, the migration of nanoparticles through the gel should be recorded at different voltages (s. Abb. 3), so that an insight is gained about the **particle-gel-interactions**.

Suitable for research assistants and all type of thesis'

which can be done by students who work on their degree in chemistry, bioengineering, biotechnology or any similar studies with training in laboratory practice. The range of the project can be adjusted to suit your interest and the requirements each thesis type demands.

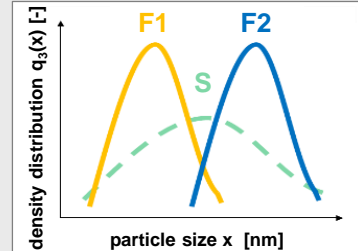


Abb. 1 (top): Schematic depiction of synthesized particle size distribution S and the two resulting fractions F1 and F2.

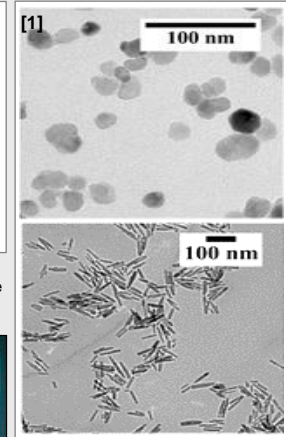


Abb. 2 (top): TEM image of controlled synthesized rod and spherical shaped ZnO-nanoparticles.

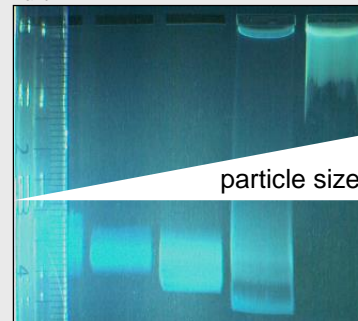


Abb. 3 (left): Record of a 0.2 % agarose gel with different sizes of SiO₂-nanoparticles at 80 V after 40 min.

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