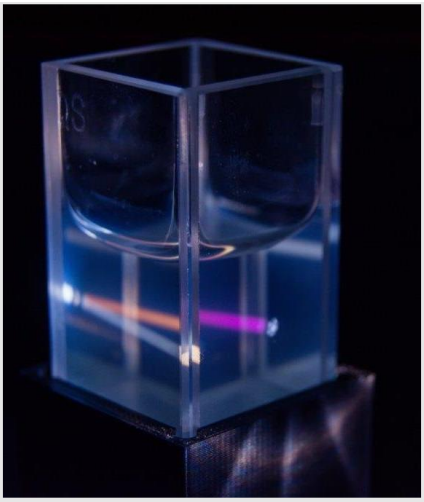
Lehrstuhl für Technische Thermodynamik
Institute of Engineering Thermodynamics
Prof. Dr.-Ing. Stefan Will

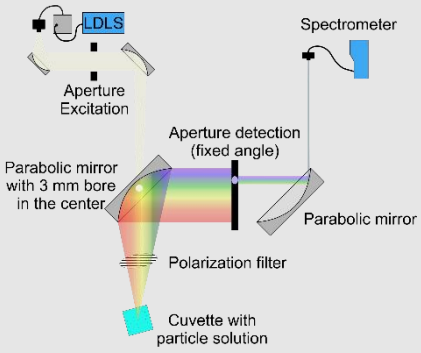
Bachelor thesis
Project thesis
Master thesis

Determination of particle size distribution in particle suspensions

Supervisor: Stefan Buchstaller
Starting time: April 2024
Topics: Particle measurement technology, optics, Characterization of nanoemulsions.



Measurement of broadband light scattering



Schematic set-up of broadband light scattering

One major topic of the working group "Particle Measurement Technology" at the Institute of Engineering Thermodynamics is the investigation and characterization of processes for nanoparticle production. Here, the development of new optical measurement techniques for a better understanding of the process is in the foreground.

Emulsions in the micro- and nanometer range play an essential role in many processes, for example in the food and pharmaceutical industries. Therefore, the size of the particles produced has a significant influence on the subsequent product properties, such as the flow behavior or the release rate of drugs.

In this work, a setup for broadband light scattering (diagram below) will be used to determine particle size distributions. The characterization of the particles will take place under different flow conditions with either monodisperse or polydisperse samples. The focus of the work is the determination of the particle size in highly concentrated emulsions. The proportion of multiple scattering that occurs in this process is to be determined using various ideas for signal correction. Afterwards the measured signal can be corrected.

Students should have an interest in particle measurement technology and laboratory work and be able to work independently. Basic knowledge in the above-mentioned subject areas is advantageous, but not required.

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