

Measurement of the particle size distribution and zeta-potential of concentrated emulsions is quite a challenge. A huge amount of possible techniques is just able to measure non-concentrated systems. But thinning can lead to unwanted processes like flocculation or coalescence. Also changes in the distribution of the ions will probably occur, so the particle-particle interactions and the zeta-potential can be affected.

The investigated o/w-emulsions with or without stabilizer could be characterized with the ultrasonic spectroscopy up to concentrations of about 50 wt.-%. This method is good validated but still not wide spread in laboratories. There are different possibilities to build up the detectors and the type of the acoustic waves within this method. The tone-burst-method is used here with a linear arrangement of sender and detector.

Additionally the influence of the particle size on the rheological behaviour was studied for the high loaded emulsions.

Therefore easy o/w-„model“-emulsions with or without water soluble polymers were formulated. Both of them are used in many different branches of industry.

Rheological experiments are also able to give information of practical relevance. Not only the different components and their amount but also the mean particle size and the polydispersity influence their rheological behaviour here.

Measurement of electrical conductivity and sound speed led to insights in the thickness of the double layer, overlap volume, surface conductivity (DUKHIN-number) and MAXWELL-WAGNER frequency.

Since STOKES it is known that there is a direct connection between acoustics and rheology. But just since a few years this knowledge has been used from the technical point of view and now it is possible to compute for example bulk-viscosity and viscoelastic information from acoustic data.