

WORKGROUP FOR MULTIPHASE FLOWS

Sedimentation

Sedimentation analysis is based on the determination of the stationary velocity of the descent of particles in a fluid phase. Conditions for the method are a thorough preparation of the sample and selection of a suitable sedimentation liquid. In particular, the dispersion of the sample requires extensive experience with the method.

In the simplest case, sedimentation is carried out in the field of gravity. The method can be realized differentially (incrementally) or integrally (cumulatively). The individual measuring procedures differ substantially in the way of determination of the particle quantity. The actual sedimentation process, however, always follows the same physical laws.

Depending on particle density, grain size analyses in the range of 2 - 100 μm can be carried out using the force of gravity. Application of the measuring method will be problematic if the particles are not chemically uniform and thus have different densities. In this case, an error occurs during the calculation of particle size. This, however, will not arise if the velocity of descent is used as a dispersion size, which is often the case, for example, for the investigation of technical sedimentation processes.

The measuring range could be expanded towards smaller particles if sedimentation was carried out in a centrifugal field. Centrifugal sedimentation is, however, a substantially more complex measuring method.

Sedimentation is especially suitable for all samples already available in a wet state, such as sludges and suspensions. This method should be used in each case if the measuring task results in the determination of sedimentation speeds.

Approximately 500 to more than 1000 ml sedimentation liquid with a solid content less than 0.5% are needed for an analysis, depending on the method.

In-house sedimentation methods:

- ▶ pipette method
- ▶ sedimentation balance
- ▶ pipette centrifuge
- ▶ drop plate centrifuge