Data Processing of Nanoparticle Agglomeration from Differential Centrifugal Sedimentation

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Abstract

Nanoparticles dispersed in liquid environment are an unstable system. Even if the nanoparticles are stabilised, they tend to form agglomerates. The agglomeration is the time dependent spontaneous phenomena which have to be considered during designing experiments or commercial products. The Differential Centrifugal Sedimentation (DCS) is a technique which allow to obtain size distribution of agglomerates with very high resolution. Here, we present how to analyse time-dependent data of mixture distribution of nanoparticle agglomerates. The data processing is based on searching for parameters of individual components from normal distribution within mixture distributions. The measured mixture distributions are interpolated against time and plotted on graph. The results are then mathematical functions describing trends of parameters of individual components of a mixture distribution in time. The presented method is useful to estimate ageing processes of nanoparticle agglomerates.