PD ISO/TR 22814:2020

BSI Standards Publication

Good practice for dynamic light scattering (DLS) measurements

bsi.

National foreword

This Published Document is the UK implementation of ISO/TR 22814:2020.

The UK participation in its preparation was entrusted to Technical Committee LBI/37, Particle characterization including sieving.

In reading or applying this report, it is important to consider the following:

Section 4:

Forward angle measurements may require more scrupulous sample preparation, for example the removal of particle contamination from the cuvette.

Note: article contamination on the cuvette, or transferred from the cuvette to the sample, can cause an increase in scattering into forward angles.

The sample concentration must be appropriate for all measured angles:

a) Multiple scattering effects are mitigated in backscatter therefore requiring less dilution than side- or forward-scattering measurements.

b) The correct sample concentration should be determined with a dilution titration.

Section 4.2.1:

Many instruments report a size distribution, in addition to a cumulants result, from a multi-component fit to the correlogram.

Section 4.2.1:

DLS measures the hydrodynamic particle size, which includes the electrical double layer surrounding the particle. Other measurement techniques, for example laser diffraction, measure the volume equivalent particle size based on the physical dimensions of the particle itself. Hence DLS measurements are influenced by state of the suspending medium and hence sample dependant [ISO 13099-1, 2012].[1]. Therefore it should be noted that non-negligible differences in results may occur for weak ionic strengths and small particle sizes.

Section 4.2.1

Care is needed in the storage of DLS samples. It is good practice to store samples in a stable refrigerator and to securely stopper sample bottles with a minimal air-gap above the sample to avoid contamination by constituents of the surrounding air.

Section 4.2.2:

It should be noted that the scattering varies as the sixth power of the particle radius in the Rayleigh regime, where the particle diameter is <1/10th of the laser wavelength.

Section 4.5.2.1:

Uncertainty in the sample temperature contributes directly to the uncertainty in the reported particle size. For instruments without