

Dispersion Technology Inc. Newsletter #25

Particle sizing and Zeta potential of silica Koestrosol (basis for Certified Reference material ERM-FD100 for nano-particles) by Acoustics and Electroacoustics.

Particle size of silica Koestrosol according to different measuring methods.

Method	Particle size value [nm].
Dynamic light scattering	19.0
Centrifuge sedimentation.	20.1
Electron microscopy.	19.4
Small X-rays scattering.	21.8
Acoustics.	22.4

The full text of this study was published in the Journal "Particles Particles Systems Characterization", 27, pp. 165-171, 2012
DOI: 10.1002/ppsc.201100038

Abstract

Precipitated silica Koestrosol 1530 is the basis for the recently adopted certified reference material ERM-FD100 used for nanotechnology. A similar reference material based on another precipitated silica (silica LudoxTM) has been used for testing ultrasound based instruments for particle sizing and zeta potential in concentrated dispersions and emulsions for the past two decades. In this study we test silica Koestrosol as a potential replacement for the silica LudoxTM since the latter has not been certified.

The measurements were performed using ultrasound based instruments, which were suitable for concentrated systems. Two laboratories (USA and Germany) with 3 different instruments were involved. Samples mass fraction was 5%. The statistically averaged mass-based median particle size was found to be 22.4 ± 0.5 nm, which is within range of certified values obtained for more diluted samples. Values for ζ -potential were measured as -26.7 ± 0.9 mV, with precision that is order of magnitude better then reported before.