

Particle Size Measurement of Colloidal Silver

Introduction

A silver colloid is a suspension with a dispersed phase consisting of silver particles between 1 nm – 1 μm evenly dispersed in a continuous phase. The sample can be considered to be on the nanoparticle scale if the size of the dispersed phase particles is between 1-100 nm. In general, silver colloids are prepared by liquid phase reduction. The reducing agent type and conditions can be varied to obtain a silver colloid of a given particle size range. Silver colloidal particles can be stabilized by coating their surfaces with polymers to form 3D barriers (steric stabilization) or using the reduction potential of silver to impose electric repulsive forces between particles (electrostatic stabilization).

Because of their unique optical, electrical, and thermal characteristics, silver nanoparticles have found their way into a broad array of products including solar cells, sensors, conductive ink, paste, and fillers. Other applications for colloidal silver include micro wiring material using their high electric conductivity, and antibacterial coating.

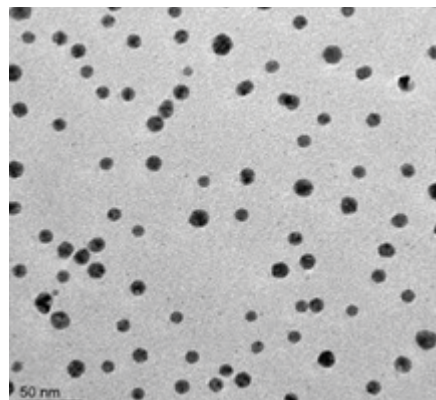


Figure 1: TEM photograph of colloidal silver suspension*

Analytical Test Method

Instrument: SZ-100 nano Partica
Sample: Silver nanoparticles
Temperature: 25° C
Dispersing medium: Hexane
Algorithm: Polydisperse, standard
Angle: 90°
Measurement duration: 90 seconds
Result format: Number distribution

Results

The measurement result of a silver colloidal sample is shown in Figure 2. The mean diameter of this sample was 2.4 nm when displayed as a number distribution. Results were generated based on the number distribution in order to better compare results to existing historic data based on microscopy.

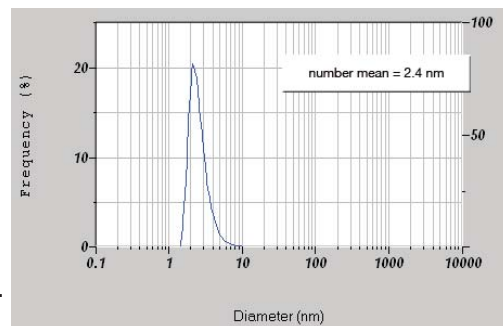


Figure 2: Colloidal silver particle size result

* Photograph courtesy: Shinko Kagaku Co., Ltd., is not necessarily related to data shown in this document.