

Particle characterization report

Characteristics of the submitted sample:

Sample code: M1Ag_ALSA

Description: Black powder in suspension (96% isopropyl alcohol).

Sample preparation:

Samples were homogenized using ultrasonic treatment in a sonicator for 30 minutes.

1. Scanning Electron Microscopy

Image acquisition was performed using a High-Resolution Scanning Electron Microscope (HR-SEM), INSPECT-F50, FEI. A STEM transmission electron detector was used, with an accelerating voltage of 10 kV.

Particles exhibit a spheroidal morphology; aggregates can also be observed (images not shown).

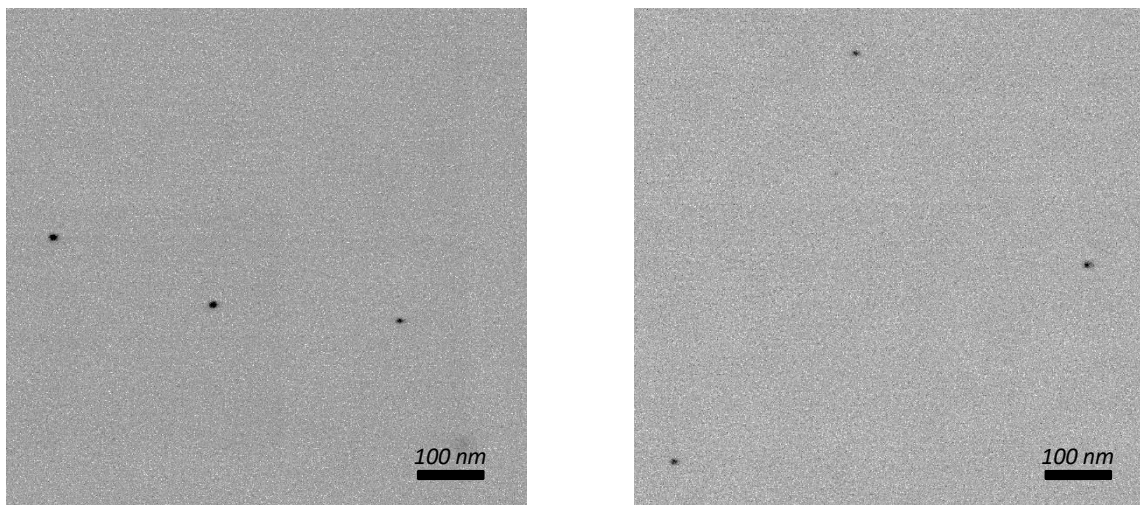


Figura 1. Micrografías de transmisión electrónica representativas de la muestra M1Ag_ALSA, obtenida por SEM con el detector de STEM. Barra equivale a una escala de 100 nm.

Size distribution

To obtain the size-distribution histogram, 101 spheroidal particles were measured (aggregates were excluded). To ensure statistical variability, particles were measured at a fixed angle. Based on the histogram (Figure 2), it was determined that this particle population fits a Gaussian curve, with the best fit being a 4-parameter curve with $r^2 = 0.9188$. The peak is 8.1 ± 0.2 nm. From the statistical analysis, it can be confirmed with 95% confidence that 50% of the particles have a size between 6.8 and 10.9 nm (Table 1). This analysis indicates that the sample distribution shows low dispersion, which is confirmed by the obtained mean of 9.5 with a standard deviation of ± 4 nm.

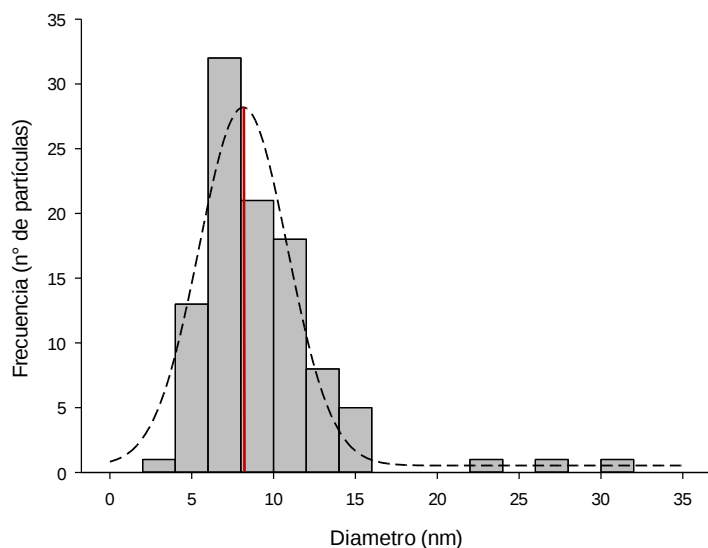


Figura 2. Histograma de distribución de tamaño de 101 partículas. Línea negra segmentada describe el mejor ajuste. Línea roja indica el *peak* del ajuste de la curva.

Tamaño (nm)	Número de partículas	% de partículas
0-5	4	4
5-10	63	62
10-15	27	27
15-20	4	4
20-25	1	1
25-30	2	2
Total	101	100

Tabla 1. Rango de diámetro de las partículas y porcentajes de distribución. En rojo se marcan los rangos de tamaño que tienen un mayor porcentaje de la población.

2. Results summary

Sample characterization was performed by electron microscopy. The data obtained indicate that the particles have a homogeneous distribution and sizes between 5 and 10 nm. The analysis results are summarized in Table 2.

Tabla 2. Resumen de resultados

Muestra M1Ag_ALSA

Tamaño (STEM)	8,1 ± 0,2 nm
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The images and data files used to prepare this report are provided as attachments. For image analysis and particle size recording, ImageJ software version 1.5 was used. For plotting and performing the statistical analysis, SigmaPlot software version 12 was used.



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