CLEMEX

Sphere Characterization

Image Analysis Report **227**

Sample Description

Image of spheres from a SEM in BMP format.

Purpose of Analysis

Demonstrate the ability of the Clemex Vision image analyzer to discriminate and measure the spheres and their pores.

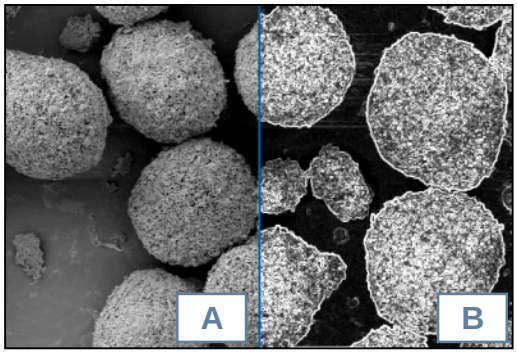

Figure 1: a) *Original image.* ***b)*** *The original image was modified by a gray transformation to outline the spheres (Sobel).*

Procedure

Some binary operations were used to complete spheres, remove artifacts and separate spheres (Closing, Chord Size, Opening, Separate).

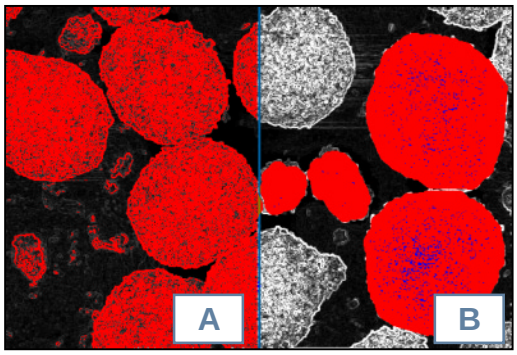

Figure 2*:* ***a)*** *The sphere outlines were binarized into red bitplane by Gray Thresholding.* ***b)*** *Final detection of spheres (red) and pores (blue) overlaid against the modified gray image.*

Results Summary

	Diameter (µm)	*Sphericity*
Minimum:	*45.5*	*0.87*
Maximum:	*180.7*	*0.94*
Mean:	*111.3*	*0.91*
Standard Deviation:	*59.7*	*0.03*
Count:	*8*	
Pores (area %)	*3.84*	

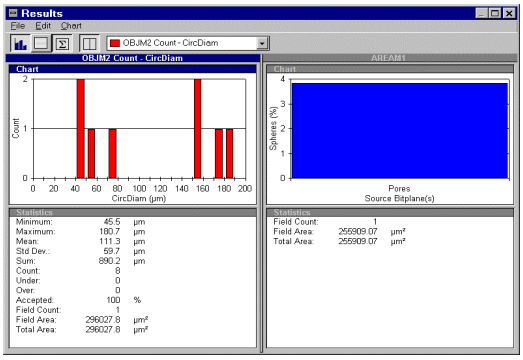

Figure 3: a) *Circular Diameter distribution.* ***b)*** *Area of pores compared to the total area covered by the spheres (as a percentage).*

Equipment

Image Analysis System:	Clemex Vision SE
Source :	Image from a SEM in BMP format.