HORIBA Scientific

Application Note

Measuring Low SSA Standards

AN223

MEASURING LOW SPECIFIC SURFACE AREA STANDARDS WITH THE HORIBA SA-9600

A feasibility study to measure low specific surface areas with the HORIBA SA-9600 was performed using Certified Reference Materials BCR 169, 170 and 172 from the European Commission Joint Research Centre. The reference materials consist of two alpha-alumina powders and one quartz powder, with certified values 0.1, 1.05, 2.56 m^2/gram, respectively. The results show that HORIBA SA-9600 can measure low specific surface area, with great agreement with certified values.

Analytical Test Method

1. Prepare sample.

a. Record the weight of an empty cell (tare weight).

b. Mix sample in the original sample bottle by shaking and add sample into the cell until it is nearly full.

c. Put the cell in the cell holder and connect to a prep station.

d. Fit the heating mantle around the cell and connect the heating mantle wires to the prep station.

e. Degas the sample using the conditions in the table below.

f. After degassing is complete, remove the heating mantle and let the cell cool down for 15 minutes.

Standard	Degas Temperature and Time	Sample Weight
BCR 169	75 °C For 8 hours	4.1381 g
BCR 170	140 °C For 8 hours	1.8416 g
BCR 172	140 °C For 8 hours	1.3035 g

2. Take single-point measurements.

a. Set up test conditions for a single-point measurement.

b. Set signal floor to two.

c. Set Purging time to 300 seconds.

d. Carefully fill dewar approximately 2/3 full of liquid nitrogen.

e. Place dewar on tray under measurement station.

f. Lock in degassed sample cell and holder into measurement station.

g. Take a measurement.

h. After the measurement is complete, reweigh sample to obtain post-degas sample weight.

i. Input post-degas sample weight to recalculate the specific surface area.

Test Results

Standard	Certified Value m^2/gram	Uncertainty m^2/gram	SA-9600 Results m^2/gram
BCR 169	0.104	0.012	0.09
BCR 170	1.05	0.05	1.05
BCR 172	2.56	0.10	2.54

Summary

The HORIBA SA-9600 can measure low BCR specific surface area standards with certified values of 0.1, 1.05, 2.56 m^2/gram with excellent agreement to the certified values.