

Measuring of Carbon Black

SALD-7101H and MS -71

Alternative instruments and accessories leading to similar results:

- SALD -2300 with BC-23



Background

Carbon blacks color and small size make it basically difficult to measure it by Laser Diffraction Methods. Due to the strong light absorption of the particles, the sensor of the instrument detects only very weak intensities of diffracted light. SALD-7101H has a high sensitive optical system and therefore it's possible to measure such kind of samples.

Measurement

A small spoon of sample from the sample was carefully suspended with 3 drops of neutral detergent. Afterwards 40-50ml of pure water was added and the suspension was set 60s into an ultrasonic bath.

The pump of the sampler MS-71 was started and a few droplets from the suspension were added to the water filled beaker of the sampler until an optimum light intensity of 40-50% is obtained. Now the measurements were started.

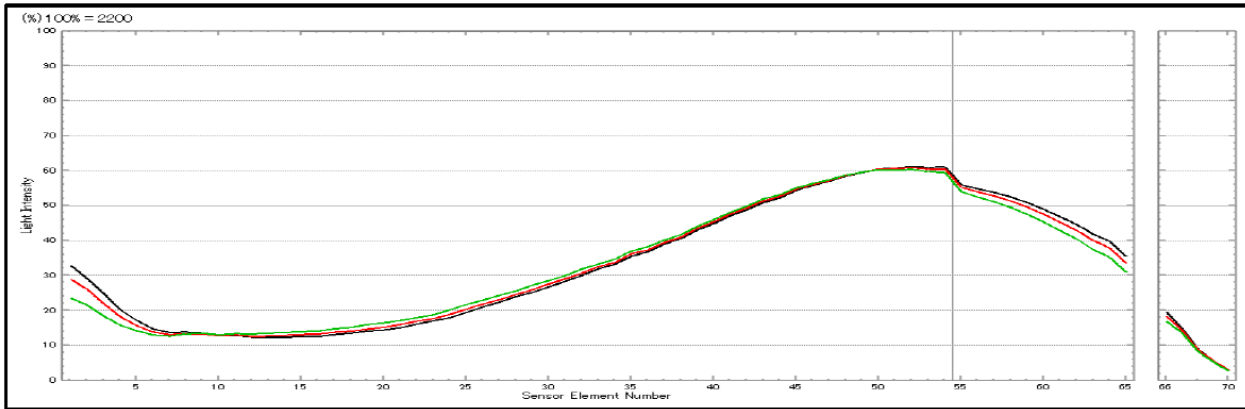
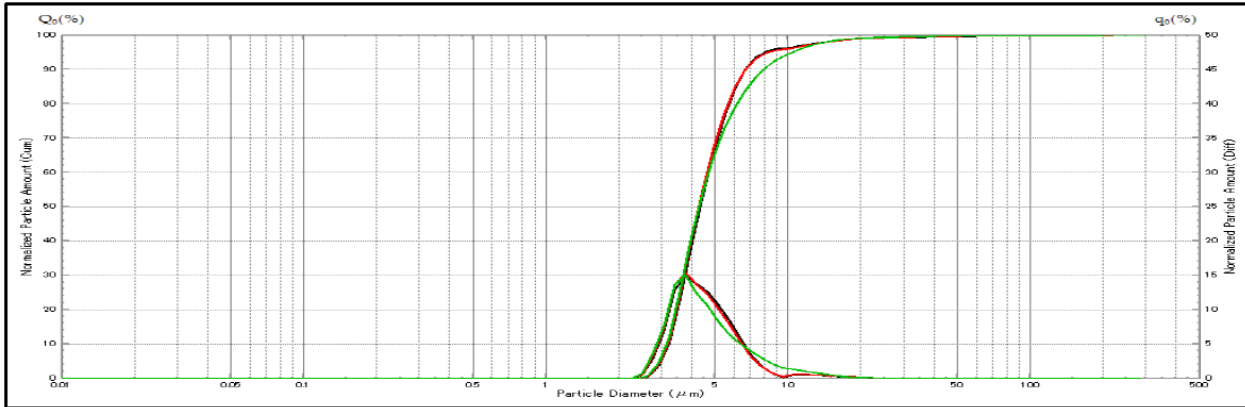
Discussion

(Please find measurement results on the next page)

Small and dark colored particles are a challenge for particle size instruments using laser diffraction methods in general. Nevertheless with our SALD-7101H and our SALD-2300 such measurements are easy to realize due to their high sensitive optical setup.

Another advantage of this optical setup is that rather low concentrated samples can be measured as well

Results



	Median D (μm)	Modal D (μm)	Mean V (μm)	Std Dev	25%D (μm)	50%D (μm)	75%D (μm)	0%D (μm)	0%D (μm)	0%D (μm)	0%D (μm)	0%D (μm)	0%D (μm)
1	4.332	3.548	4.586	0.165	3.576	4.332	5.422	0.000	0.000	0.000	0.000	0.000	0.000
2	4.268	3.548	4.546	0.167	3.537	4.268	5.355	0.000	0.000	0.000	0.000	0.000	0.000
3	4.288	3.548	4.685	0.179	3.520	4.288	5.690	0.000	0.000	0.000	0.000	0.000	0.000

The upper graph shows a volume based particle size distribution with a peak around $5\mu\text{m}$. The lower graph shows the corresponding light distribution. Despite the high absorption of the particles the lower graph shows a reasonable high light intensity.