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Press Release

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The new draft TOC standard:
Suspension method according to DIN EN 15936

TOC determination in solids in just three steps /
Fast, easy and accurate method /
Statistically reliable multiple determination in one sample batch

Shimadzu, one of the worldwide leading manufacturers of analytical instrumentation, has developed a user-friendly suspension method in cooperation with ALBO-tec environmental laboratory and the responsible authorities. Since June 2009, this method has been described in the draft DIN EN 15936 standard and is intended to replace the DIN EN 13137 standard. This new method enables TOC determination in solid samples in just three steps: fast, easy and accurate.

To date, current rules and regulations (DEV/DIN) have required a direct dry combustion method for TOC determination in soils, sludges and sediments. The disadvantage of this method is that each weighed and combusted sample can only be measured once. Direct combustion is therefore not suitable for dual or multiple determination. The inhomogeneity of the sample has a direct effect on the distribution of the measurement data. The method is also quite labor-intensive and time-consuming.

The new suspension method enables users to obtain results in just three steps: weighing, dispersing, measuring.

1. Weighing:

   The finely ground solid sample is weighed into an *Erlenmeyer* flask and is suspended in a diluted hydrochloric acid solution, for instance 200 mg sample in 200 mL HCl (0.22 mol/L)
2. Dispersing:

   The suspension is dispersed and homogenized using a dispersion drive – three minutes at a speed of 17,000 - 18,000 rpm
3. Measuring:

   The suspension is transferred to autosampler vials and measurement can be started immediately.

Evaluation

The possibility of multiple injections makes the suspension method highly accurate and enables statistically reliable multiple determinations within a single sample batch. The new suspension method has already been successfully applied in several round robin tests.

Figure 1: Step 1: The ground solid sample is being weighed.

Figure 2: The suspension is dispersed and homogenized using a dispersion drive.

Figure 3: Transferring the suspension to autosampler vials and starting measurement.

Peak number	Area	TOC concentration of the suspension in mg/L	TOC concentration of the sample in %
1	183.7	24.71	2.47
2	180.9	24.23	2.42
3	189.0	25.61	2.56
4	183.8	24.72	2.47
5	179.9	24.06	2.41
6	179.9	24.06	2.41
7	178.9	23.89	2.39
8	186.9	25.25	2.53
9	181.6	24.35	2.44
10	177.6	23.67	2.37
MW	**182.2**	**24.5**	**2.45**
standard deviation	**3.43**	**0.62**	**0.06**
stand. dev. in %	**1.88**	**2.52**	**2.49**

Table 1: Measured values for a 10-fold injection.

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