

## *Determination of carbon and sulfur in cement*

Cement and concrete are being used in various applications, but mainly in the building and housing industry. Elemental analysis for the determination of carbon and sulfur concentrations is routine analysis of such materials to assure the product quality. Due to the high temperature resistance of these materials, extremely high temperatures need to be reached to combust the samples. The modern solid-state induction furnace used in the inductar® CS cube enables such high temperatures of more than 2000°C. Furthermore, the new crucible geometry minimizes dust and debris in the system, which is important for light cement powders as cement and concrete.

Five cement samples were milled to powder prior to combustion analysis. In general, 150 – 200 mg of the samples were analyzed, but for more heterogeneous samples higher sample amounts are recommended. In order to reach the necessary temperature, accelerators (2 g EXACC WS and 0.5 g EXACC FE) were added to the sample in the ceramic crucibles.

MATERIAL	C [%]	SD	S [%]	SD
Cement powder sample - 1	0.257	0.014	1.164	0.017
Cement powder sample - 2	9.592	0.020	0.344	0.005
Cement powder sample - 3	9.551	0.027	0.183	0.004
Cement powder sample - 4	0.303	0.003	0.210	0.020
Cement powder sample - 5	0.144	0.003	0.014	0.001

The results, presented in the table above, show the high reproducibility and the low cross-sensitivity of the wide-range IR detector between carbon dioxide and sulfur dioxide.

### INSTRUMENT:

inductar® CS cube

### DETAILS:

carrier gas: oxygen

sample: 150 – 200 mg dry powder



**Elementar Analysensysteme GmbH**  
Elementar-Straße 1  
63505 Langenselbold (Germany)  
phone: +49 (0) 6184 9393-0  
info@elementar.com | www.elementar.com

