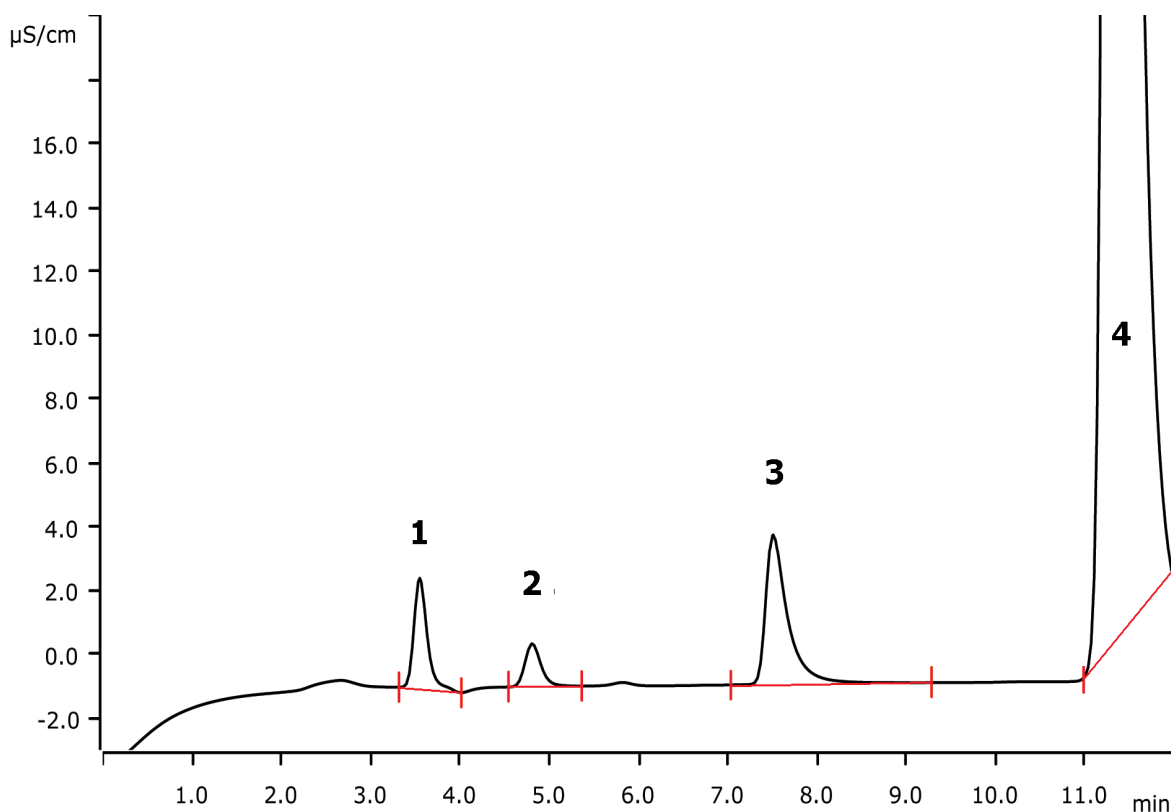# Fluorine in coal sample applying Metrohm Combustion IC according to ASTM D8247

Coal contains a certain amount of fluorine, chlorine, and sulfur compounds. During combustion of the coal, these components release corrosive acids (e.g., fluorine compounds form hydrofluoric acid). Thermal power plants therefore request low-fluorine coal to avoid massive hydrofluoric acid production. In this application note, fluorine content in coal is determined by ion chromatography after pyrohydrolysis.

Results

	1 Fluorine [mg/kg]	2 Chlorine [mg/kg]	3 Unknown	4 Sulfur
Coal	87.9	55.8	-	n.q.

Ω Metrohm

Sample

Coal

Sample preparation

The sample is analyzed by Metrohm Combustion IC with flame sensor technology and intelligent Partial Loop Injection Technique with Inline Matrix Elimination.

Columns

Metrosep A Supp 5 - 150/4.0	6.1006.520
Metrosep A Supp 4/5 Guard/4.0	6.1006.500
Metrosep A PCC 1 HC/4.0	6.1006.310
Metrosep A Trap 1 - 100/4.0	6.1014.000
Metrosep I Trap 1 - 100/4.0	6.1014.200

Solutions

Eluent	3.2 mmol/L sodium carbonate 1.0 mmol/L sodium hydrogen carbonate
Suppressor regenerant	100 mmol/L sulfuric acid
Rinsing solution	STREAM
Absorber solution	200 mg/L hydrogen peroxide

Parameters

Flow rate	0.7 mL/min
Injection volume (IC)	50 µL (MiPT)
P_{max}	15 MPa
Recording time	12 min
Column temperature	30 °C

Combustion parameters

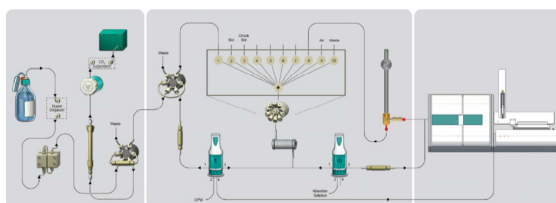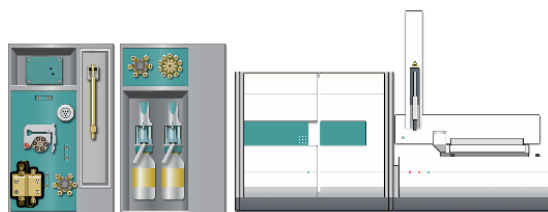|	
Argon	100 mL/min
Oxygen	300 mL/min
Oven temperature	1100 °C
Post-combustion time	400 s
Initial volume of absorption solution	2.0 mL
Water inlet	0.2 mL/min

Analysis

Conductivity after sequential suppression

Instrumentation

930 Compact IC Flex Oven/SeS/PP/Deg	2.930.2560*
IC Conductivity Detector	2.850.9010*
MSM Rotor A	6.2832.000*
Adapter sleeve for Suppressor Vario	6.2842.020*
920 Absorber Module	2.920.0010*
Combustion Module (oven and ABD)	2.136.0700*
Autosampler MMS 5000	2.136.0800
Kit for solid sampling	6.7302.000

* available as 930 Metrohm Combustion IC (2.930.9010)

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