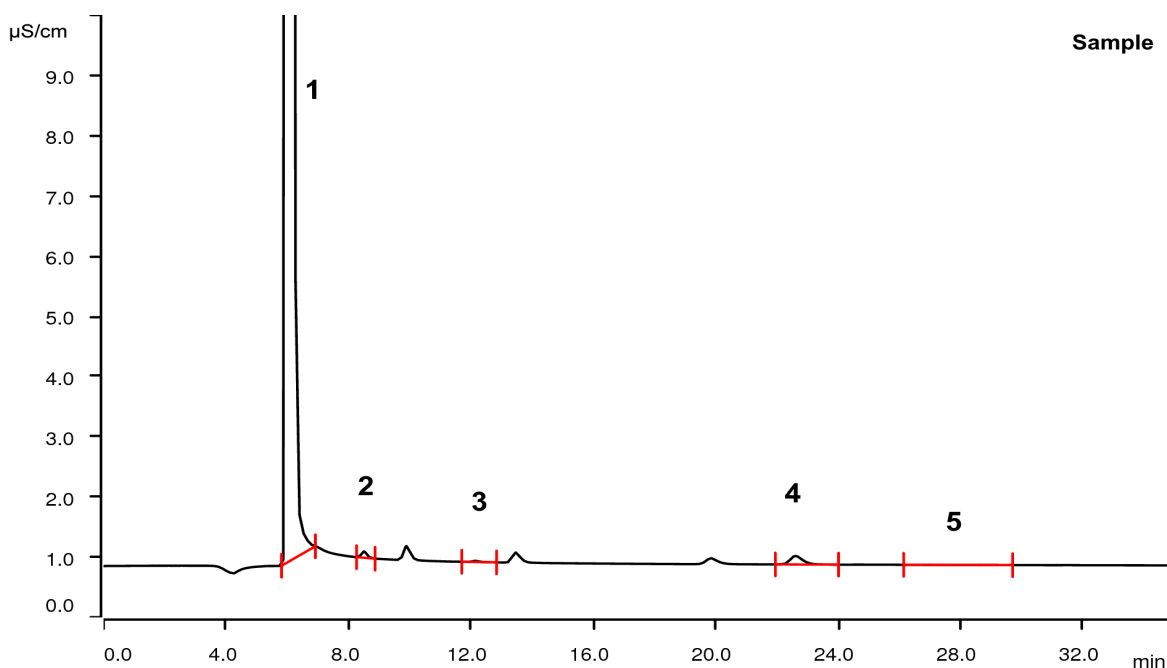


Halogens in polymer by Combustion Ion Chromatography



Polymer materials that are used for building and decoration purposes need to be flame resistant. To reach the required level of resistance flame-retardants are added to the plain polymer. Flame-retardants are often haloorganic compounds. The use of such components and the respective concentration of introduced halogens can be determined by Combustion IC. The recovery over the full system is tested with a certified reference material (CRM).

Results

	Concentration [mg/kg] (N = 3)	RSD [%] (N = 3)	Recovery [%] (system test with CRM EC680K)	RSD [%] (N = 3)
1 Fluorine	524	3.6	-	-
2 Chlorine	3.2	4.8	94	1.8
3 Bromine	1.4	4.2	100	2.3
4 Sulfur	n.q.	-	-	-
5 Iodine	n.d.	-	-	-

Not integrated peaks are: nitrite, nitrate and phosphate; n.d. = not detected, n.q. = not quantified

Sample

Technical polymer.

Sample preparation

The sample (20 - 50 mg) is exactly weighed in to the quartz sample boat. The sample is then covered with a quartz fleece and subsequently analyzed by Combustion IC with flame sensor technology and intelligent Partial Loop Injection Technique.

Columns

Metrosep A Supp 5 - 250/4.0	6.1006.530
Metrosep A Supp 5 Guard/4.0	6.1006.500
Metrosep A PCC 2 HC/4.0	6.1006.340
Metrosep I Trap 1 - 100/4.0	6.1014.200
Metrosep A Trap 1 - 100/4.0	6.1014.000

Solutions CIC

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	100 mg/L H ₂ O ₂

Analysis

Conductivity after sequential suppression

Parameters

Flow rate	0.7 mL/min
Injection volume (IC)	200 µL (MiPT)
P _{max}	15 MPa
Recording time	35 min
Column temperature	32 °C

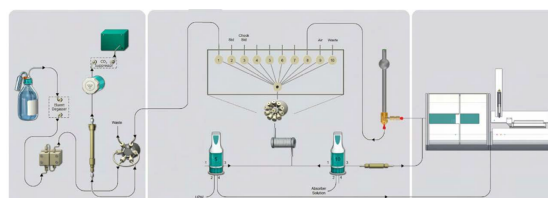
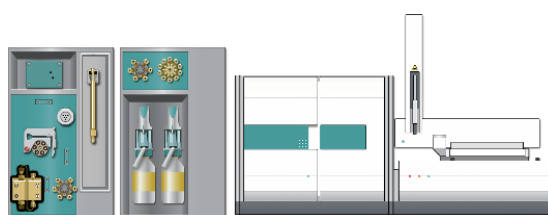
Combustion parameters

Argon	100 mL/min
Oxygen	300 mL/min
Oven temperature	1050 °C
Post-combustion time	300 s
Initial volume of absorption solution	2.0 mL
Absorber solution feed	0.2 mL/min
Water inlet	0.1 mL/min
Post-combustion rinsing volume	1.0 mL

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
Quartz Sample Boat 40x9 mm	6.7302.100
Quartzfilter for liquid samples, 3 pcs	6.7303.220

* available as 930 Metrohm Combustion IC (2.930.9010)



www.metrohm.com

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