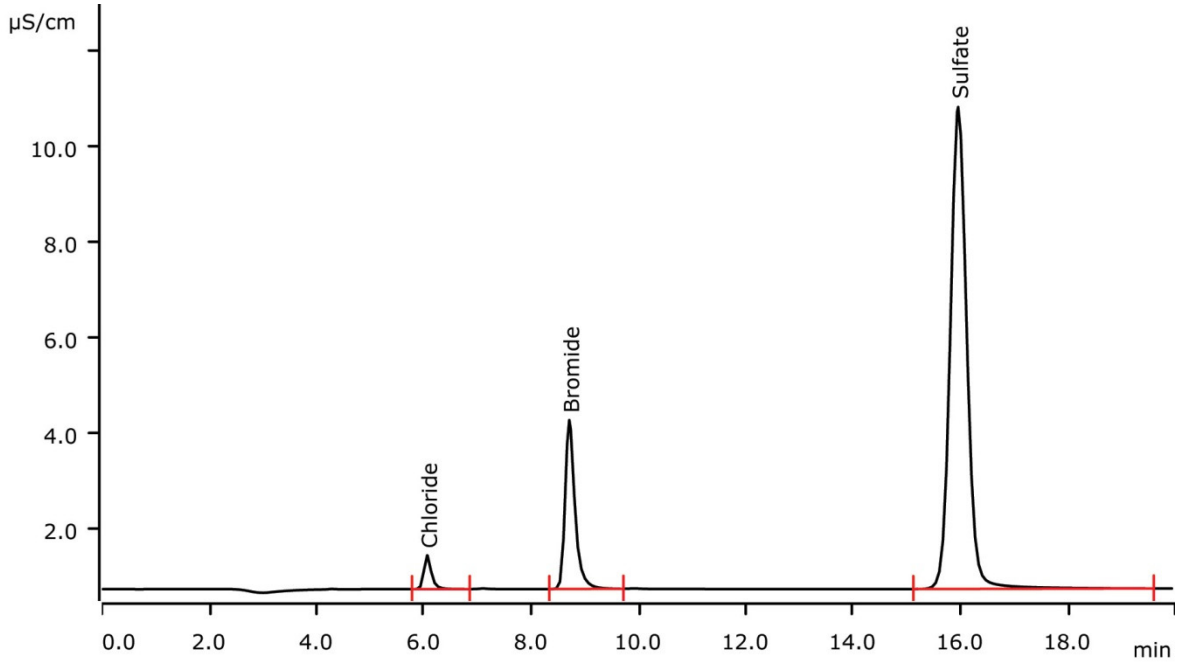
IC Application Note CIC–010

Halogens in a polymer sample applying Metrohm Combustion IC according to IEC 60754



The Restriction of Hazardous Substances Directive (RoHS) requires to reduce the halogen content in several organic materials used in electrical and electronic equipment. In this context, there is a huge interest for using halogen-free polymers. To check for halogens in polymers according to standard IEC 60754, Metrohm Combustion IC applying flame sensor technology and Inline Matrix Elimination is an indispensable method. The examined polymeric material contains halogens at a level of up to 1%.

Results

	Mean [g/kg] (n = 3)	RSD [%] (n = 3)
Chloride	0.6	6.8
Bromide	10.3	4.1
Sulfate	n.q.	n.q.

Metrohm

Sample

Polymer sample

Sample preparation

Combustion with flame sensor technology, intelligent Partial-Loop Injection (MiPT) 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

Solutions

Eluent	3.2 mmol/L sodium carbonate 1.0 mmol/L sodium hydrogen carbonate
Suppressor regenerant	100 mmol/L sulfuric acid
Rinsing solution	Ultrapure water
Absorption solution	100 mg/L hydrogen peroxide

Parameters

Flow rate	0.7 mL/min
Injection volume	4 µL
P_{max}	15 MPa
Recording time	20 min
Column temperature	30 °C

Combustion parameters

Argon	100 mL/min
Oxygen	300 mL/min
Oven temperature	1050 °C
Post-combustion time	120 s
Initial volume of absorption solution	2.0 mL
Water inlet	0.2 mL/min

Analysis

Conductivity after sequential suppression

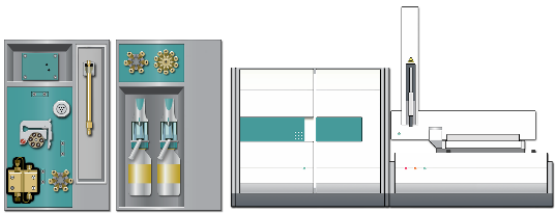
Instrumentation

881 Compact IC pro – Anion – MCS	2.881.0030*
IC Conductivity Detector	2.850.9010*
920 Absorber Module	2.920.0010*
Combustion Module	2.136.0700*
Autosampler MMS 5000	2.136.0800
Kit for solid samples	6.7302.000

* available as 881 Metrohm Combustion IC (2.881.3030)

Calibration MiPT

Calibration range	Factor of 5	
Standard solution		
Chloride, bromide	100 mg/L	
1. Level	20 mg /L =	40 µL
2. Level	30 mg /L =	60 µL
3. Level	50 mg /L =	100 µL
4. Level	100 mg /L =	200 µL



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Version 2, published in December 2020

Metrohm