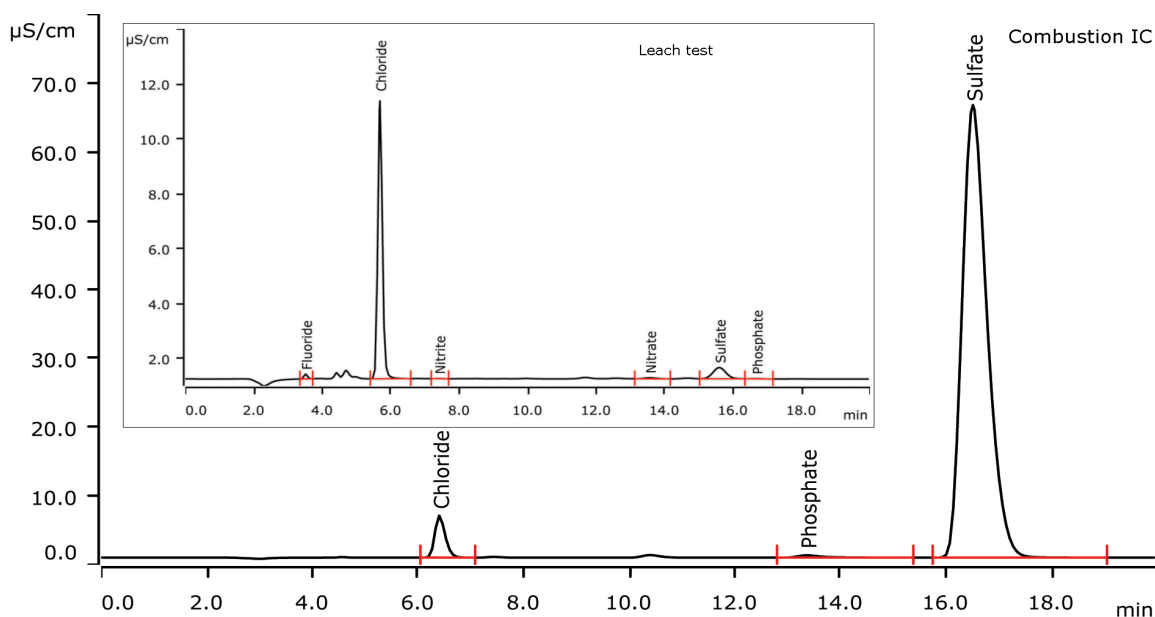


Total and leachable concentration of halogens and sulfur in latex gloves using Combustion IC and a leach test



Latex gloves are used in cleanroom environments to eliminate contaminants. In nuclear power plants, the use of gloves containing corrosive materials such as halogen or sulfur is restricted. For analysis of the total halogen and sulfur content, Combustion IC is used. To characterize if gloves are free of leachable halogen and sulfur compounds, a leach test is required. Sample preparation consists of Inline Preconcentration and Inline Matrix Elimination (MiPCT-ME) as described in AN-S-304.

Results

Analyte	CIC [g/kg]	CIC RSD [%]	Leach [mg/kg]
Fluoride	n.d.		0.6
Chloride	0.6	4.4	28.9
Nitrite			0.2
Nitrate			0.9
Sulfur (sulfate)	7.3	4.7	6.2
Phosphate			0.3

Method description

Sample

Latex gloves

Sample preparation

Combustion, inline injection of the absorption solution after Inline Matrix Elimination. Leaching test with 0.5 g glove material and 200 mL ultrapure water, injection applying MiPCT-ME.

Column (Combustion IC)

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

Column (leach test)

Metrosep A Supp 16 - 150/4.0	6.1031.420
Metrosep A Supp 16 Guard/4.0	6.1031.500
Metrosep A PCC 1 HC/4.0	6.1006.310

Solutions

Eluent (Combustion IC)	3.2 mmol/L sodium carbonate 1.0 mmol/L sodium hydrogen carbonate
Absorption solution	30 mg/L hydrogen peroxide 1 mg/L phosphate
Eluent (leach test)	7.5 mmol/L sodium carbonate 0.75 sodium hydroxide
Suppressor regenerant (both)	100 mmol/L sulfuric acid
Rinsing solution (both)	Ultrapure water

Analysis

Conductivity after sequential suppression

Parameters (Combustion IC)

Flow rate	0.7 mL/min
Injection volume	100 µL
P _{max}	15.0 MPa
Recording time	20 min
Column temperature	30 °C

Combustion parameters

Oven temperature	
Inlet / Outlet	900 / 1000 °C
Absorption solution	7.0 mL

Parameters (leach test)

Flow rate	0.8 mL/min
Injection volume	2000 µL
P _{max}	20.0 MPa
Recording time	20 min
Column temperature	35 °C

Instrumentation (Combustion IC)

881 Compact IC pro – Anion – MCS	2.881.0030
IC Conductivity Detector	2.850.9010
800 Dosino	2.800.0010
Remote box	6.2148.010
Mitsubishi AQF-100	*
Mitsubishi ABC-100	*
Mitsubishi WS-100	*
Mitsubishi GA-100	*

* from local Mitsubishi distributor / not shown in system graphic below

Instrumentation (leach test)

881 Compact IC pro – Anion – MCS	2.881.0030
IC Conductivity Detector	2.850.9010
2 x 800 Dosino	2.800.0010

No graphic shown



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