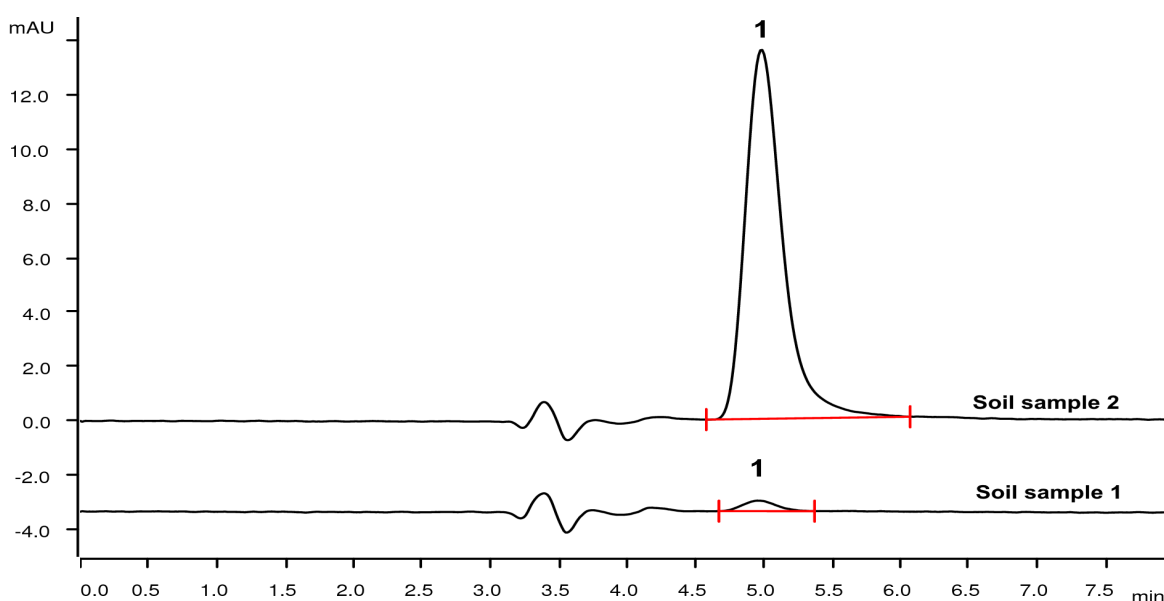


Chromate in strongly alkaline digestion solution according to EN ISO 15192 (digested soil) and EN 16318 (fertilizer)



Hexavalent chromium (chromate) in soil needs to be minimized as it acts cancerogenic. Chromate may be introduced to soil by applying fertilizers containing Cr(VI). Most of this chromate is reduced to Cr(III) by oxidizing organic matter. The remaining chromate is determined according to EN ISO 15192 by alkaline digestion followed by ion chromatography with post-column reaction with 1,5-diphenylcarbazide and subsequent visible detection at 538 nm. Procedure B of EN 16318 applies the alkaline digestion and the same analytical procedure to fertilizers.

Results

1 Chromate Cr(VI)	Conc. in digest [µg/L]	Conc. in soil [mg/kg]
Soil sample 1	3.2	0.13
Soil sample 2	111.8	4.47

Method description

Sample

Akaline soil digest

Sample preparation

Soil sample is digested according to EN ISO 15192. The digest is injected after filtration through 0.45 µm.

Column

Metrosep A Supp 16 - 250/4.0	6.1031.430
Metrosep A Supp 10 Guard HC/4.0	6.1020.520

Solutions

Eluent	250 mmol/L ammonium sulfate 50 mmol/L ammonium hydroxide
Post-column reagent	2.0 mmol/L 1,5-diphenyl-carbazide 10% methanol 500 mmol/L sulfuric acid

Parameters

Flow rate	0.7 mL/min
Flow rate PCR	0.2 mL/min
Injection volume	50 µL
P _{max}	20 MPa
Column temperature	45 °C
Reactor temperature	45 °C
Detection	538 nm
Reference	650 nm
Run time	8 min

Analysis

UV/VIS after PCR

Instrumentation

930 Compact IC Flex Oven/Deg	2.930.2160
858 Professional Sample Processor – Pump	2.858.0020
944 Professional UV/VIS Detector Vario	2.944.0010
Reactor complete (placed in the column oven)	6.2845.200
Holder for Reactor	6.2057.240

