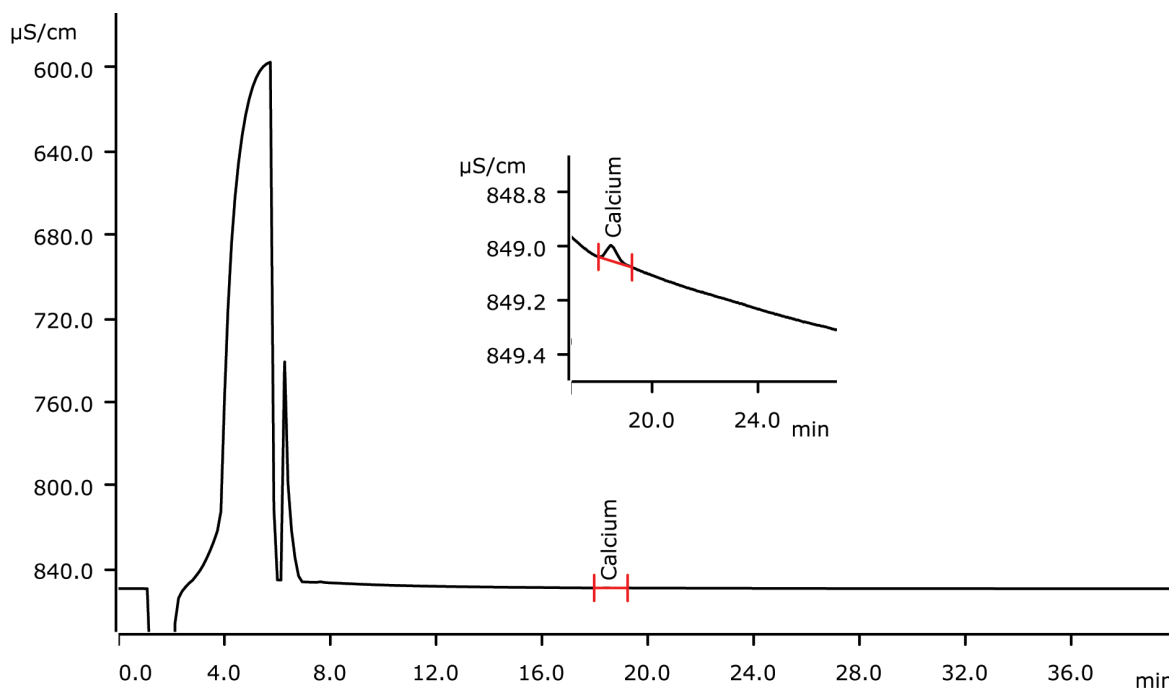


# Calcium in Bayer liquor



To refine bauxite to alumina, the bauxite ore is digested under pressure with a sodium hydroxide solution at a temperature between 150 and 200 °C. Trace analysis of calcium in the resulting Bayer Liquor requires dilution and pH adjustment. This is accomplished in a single step with 170 mmol/L citric acid. The citric acid sets the sample pH to approximately 4.5 and prevents aluminum precipitation. The separation is done on a Metrosep C 4 - 150/4.0 column with a citric acid eluent.

## Results

	Concentration [mg/kg]	RSD [% , n = 25 <sup>*)</sup> ]	Recovery [% , n = 10]
Calcium	5.1	3.2	95

<sup>\*)</sup> five dilutions with five replicate determinations each

## Sample

Bayer liquor

## Sample preparation

Dilution 1:20 (w/w) with diluent. Injection applying intelligent Partial Loop Injection Technique (MiPT)

## Columns

Metrosep C 4 - 150/4.0	6.1050.420
Metrosep C 4 Guard/4.0	6.1050.500

## Solutions

Eluent	10 mmol/L citric acid
Diluent	170 mmol/L citric acid

## Analysis

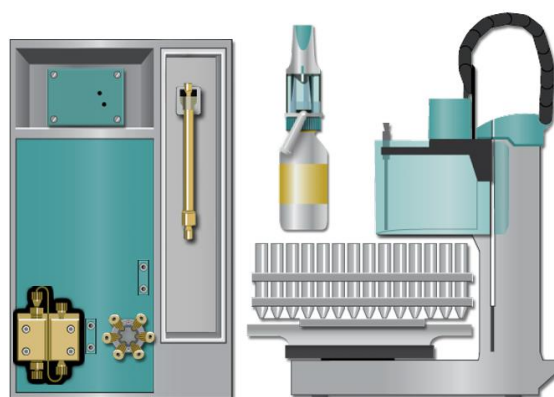
Direct conductivity detection

## Parameters

Flow rate	0.9 mL/min
Injection volume (MiPT)	20 $\mu$ L
P <sub>max</sub>	20 MPa
Recording time	40 min
Column temperature	30 °C

## Instrumentation

930 Compact IC Oven/Deg	2.930.2160
IC Conductivity Detector	2.850.9010
858 Professional Sample Processor	2.858.0010
800 Dosino	2.800.0010
IC equipment: MiPT	6.5330.180



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