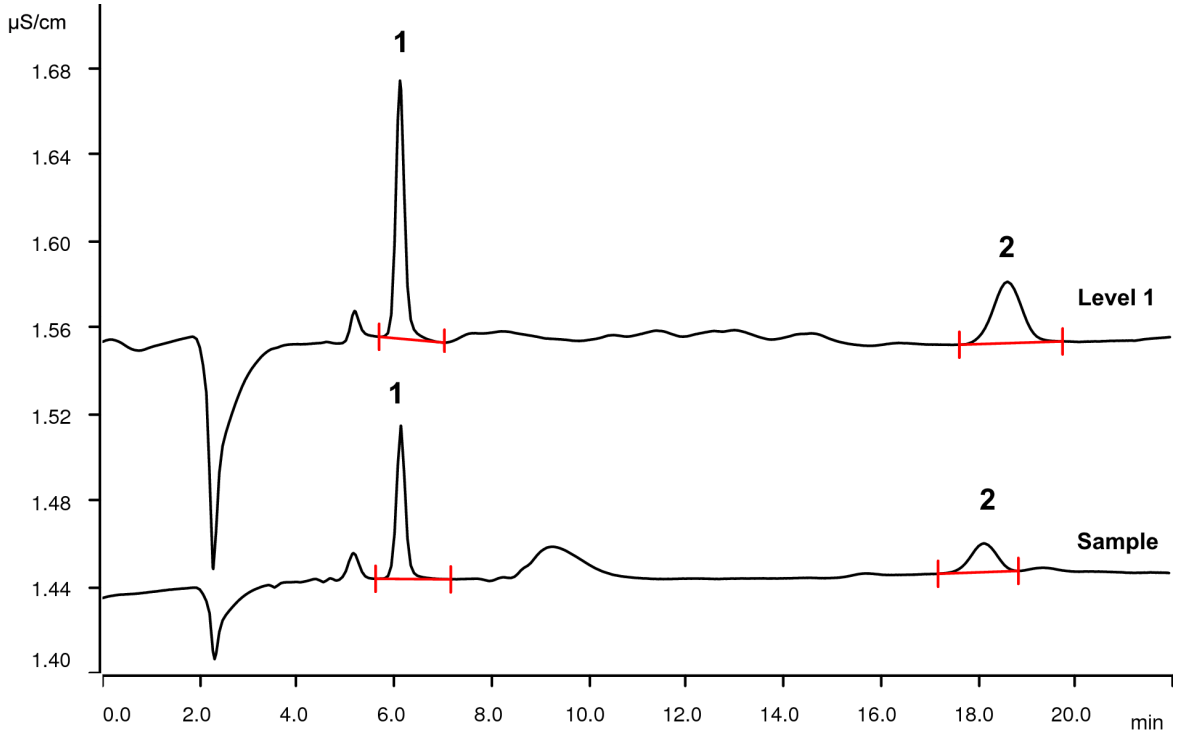
IC Application Note S–370

# Chloride and sulfate impurities in potassium bicarbonate




Within the scope of the modernization of USP, chloride and sulfate are determined as impurities in potassium hydrogen carbonate (bicarbonate). USP41 monograph for potassium bicarbonate does not check for chloride and sulfate. Applying ion chromatography with conductivity detection after sequential suppression allows quantifying these impurities.

## Results

| | Sample | Conc.** [mg/L] | Corr. Coef. NLT = 0.99 | Conc. Calib. Level 1 [mg/L] | RSD [%, N = 6] NMT[1] = 5 % | Signal/Noise NLT[2] = 20 |
|---|---|---|---|---|---|---|
| 1 | Chloride | 0.041* | 0.9989 | 0.050 | 0.9 | 185 |
| 2 | Sulfate | 0.038* | 0.9995 | 0.050 | 0.8 | 69 |

* Below lowest calibration level ** mg/L in solution corresponds to mg/kg in solid sample

[1] NMT = not more than [2] NLT = not less than

Metrohm

## Sample

Potassium hydrogen carbonate, USP grade

## Sample preparation

0.1 g of sample dissolved in 100 mL of ultrapure and $CO_2$ free water.

## Columns

| | |
|---|---|
| Metrosep A Supp 16 - 150/4.0 | 6.1031.420 |
| Metrosep A Supp 16 Guard/4.0 | 6.1031.500 |

## Solutions

| | |
|---|---|
| Eluent | 7.5 mmol/L sodium carbonate<br>0.75 mmol/L sodium hydroxide |
| Suppressor regenerant | 500 mmol/L sulfuric acid |
| Rinsing | STREAM |

## Analysis

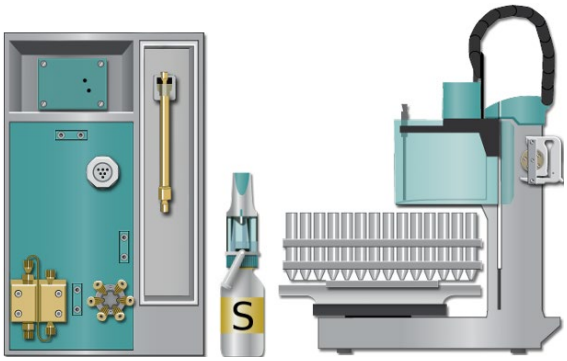
Conductivity detection after sequential suppression

## Instrumentation

| | |
|---|---|
| 930 Compact IC Flex Oven/SeS/Deg | 2.930.2460 |
| IC Conductivity Detector | 2.850.9010 |
| 858 Professional Sample Processor | 2.858.0020 |
| MSM Rotor A | 6.2832.000 |
| Adapter sleeve for Suppressor Vario | 6.2842.020 |
| IC equipment: Dosino Regeneration | 6.5330.190 |

## Parameters

| | |
|---|---|
| Flow rate | 0.8 mL/min |
| Injection volume | 50 µL |
| $P_{max}$ | 20 MPa |
| Column temperature | 45 °C |
| Run time | 22 min |
| Dosino regeneration | 0.1 mL for 9 min |




## Calibration

| Level | Chloride, sulfate [mg/L] |
|---|---|
| Level 1 | 0.05 |
| Level 2 | 0.10 |
| Level 3 | 0.50 |
| Level 4 | 0.75 |
| Level 5 | 1.00 |
| Level 6 | 1.50 |

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