

## Application Work AW IC AU6-0478-032013

# Determination of phosphate in Cola drinks.

### Branch

7. Food, stimulants, beverages, flavours

### Keywords

IC; 881; 858; Phosphate, Cola drinks

### Summary

The determination of phosphoric acid in different Coca-Cola soft drinks is done on the Metrosep A Supp 5 - 100 column, using an eluent mixture of sodium carbonate and sodium bicarbonate with sequential suppression.

### Samples

Different Cola drinks

### Instruments

881 Compact IC pro	2.881.0030
858 Professional autosampler	2.858.0020

### Columns

METROSEP ASUPP 5 – 150 / 4.0	6.1006.520
METROSEP RP2 Guard	6.1011.130

### Instrument Picture



### Reagents

- Sodium Carbonate concentrate 0.1 M  $\text{Na}_2\text{CO}_3$  in  $\text{H}_2\text{O}$ , CAS Number 497-19-8
- Sodium bicarbonate Concentrate 0.1 M  $\text{NaHCO}_3$   $\text{H}_2\text{O}$ , CAS Number 144-55-8
- Sulfuric acid concentrate 0.1 M  $\text{H}_2\text{SO}_4$  in  $\text{H}_2\text{O}$  (0.2N), CAS Number 7664-93-9
- Ultrapure water, resistivity  $>18 \text{ M}\Omega\cdot\text{cm}$  (25 °C), type I

### Solutions

Eluent	$c(\text{Na}_2\text{CO}_3) = 7.0 \text{ mmol/L}$ $c(\text{NaHCO}_3) = 3.0 \text{ mmol/L}$
Suppressor solution Rinsing/Regeneration	Ultra Pure Water $c(\text{H}_2\text{SO}_4) = 100 \text{ mmol/L}$

### Standard solutions

The sequential dilutions were carried out automatically from the highest standard. The concentrations are shown in [mg/L].

	Std. 1	Std. 2	Std. 3
Phosphate	400	500	600

### Sample preparation

The samples must be degassed prior to the injection.

The excess of carbonate is removed by placing the sample in an ultrasonic bath for 10 seconds. The residual carbonate is removed by the in-line sample degasser from the 881 Compact IC pro.

**Analysis**

The analysis was fully automated and controlled by MagICNet 2.4

**Date**

Friday, March 15, 2013

**Parameters**

Flow Eluent	0.7 mL/min
Polarity	+
Temp. coefficient	2.3 %/°C
Column temp.	35.0 °C
Injection volume	5 µL

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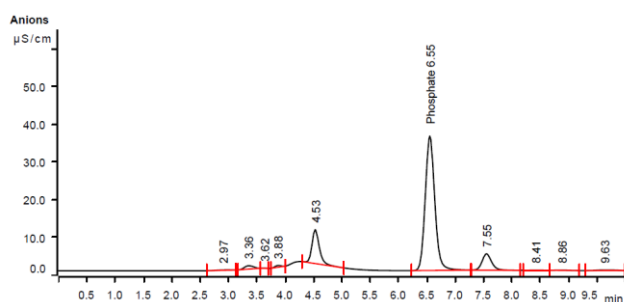
**Appendix**

- Calibration curves
- Chromatogram

**Results:**

The concentrations are shown in [mg/L] as PO<sub>4</sub><sup>3-</sup>

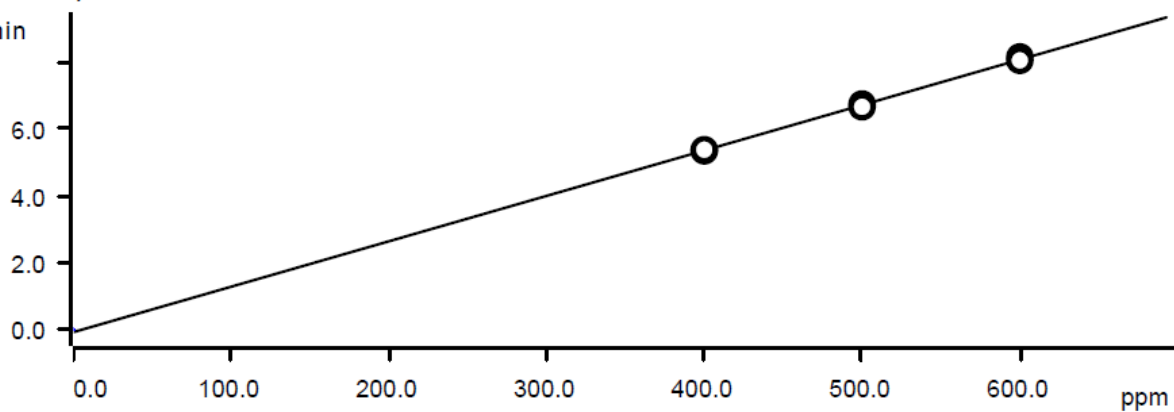
Sample	Sample 1	Sample 2	Sample 3
Injection 1	567.9	238.1	454.3
Injection 2	566.7	237.0	454.1
Injection 3	568.3	237.6	454.7
Avg.	567.6	237.6	455.7
Rel Std. (%)	0.14	0.21	0.20

**Example determination**


## Appendix: Calibration curves

### Phosphate (Anions)

( $\mu\text{S}/\text{cm}$ ) x min



Function: .....  $A = -0.0902578 + 2.72660E-3 \times Q$

Relative standard deviation ..... 0.432892 %

Correlation coefficient ..... 0.999886