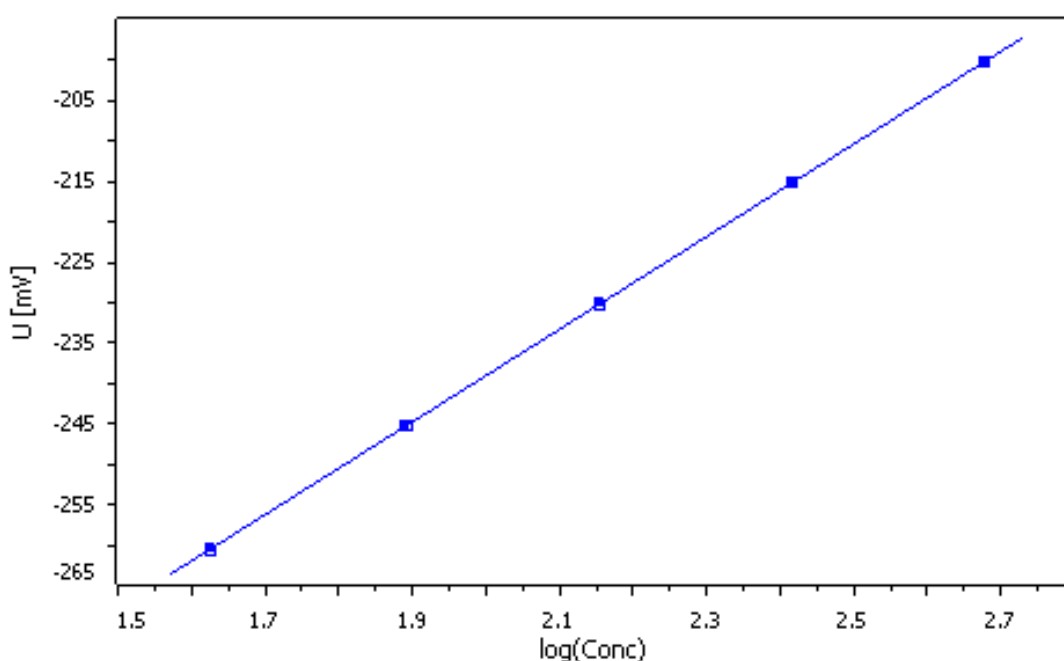# Potassium in fruit juice and wine

Fast and economical determination by ion measurement

Determination of the potassium content plays a major role in the food and beverage industry. Potassium is an essential mineral nutrient for humans. It is an important intracellular cation and also plays an important role in processes within cells, where it is involved in the regulation of numerous body functions like blood pressure, cell growth and muscle control.

To declare the potassium content of drinks and food, it is usually determined by flame photometric method. However, flame photometry is linear only over a limited concentration range, and often sample dilution is necessary. Furthermore, the instrumentation is rather complex and expensive to buy and maintain. The ion measurement method presented here is a fast, less expensive, and reliable alternative to determine potassium content in beverages.

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Method description

Sample

Fruit juices (orange juice, apple juice)

Red wine

Sample preparation

No sample preparation is required

Configuration

814 USB sample processor (1T/2P)	2.814.0020
Titration head, 3x SGJ 14	6.1458.040
Sample rack 22 x 120 mL	6.2041.470
Sample beakers plastic (PP), 120 mL, 250 pieces	6.1459.300
Propeller for 120 mL beaker	6.1909.050
802 Rod stirrer	2.802.0020
tiamo 2.5 full	6.6056.252
867 pH module	2.867.0010
800 Dosino, 3x	2.800.0010
Dosing unit, 50 mL	6.3032.250
Dosing unit, 10 mL, 2x	6.3032.210
Cable USB A- mini DIN 8 pin	6.2151.000
Electrode cable 2 m / F	6.2104.030
Electrode cable 2 m, 2 x 2 mm	6.2104.150
Combined K-ISE	6.0510.110
Temperature sensor Pt1000	6.1110.100

Solutions

Standard solution for additions	$\beta(K^+)$ = 4000 mg/L 7.455 g dried potassium chloride is weighed into a 1 L volumetric flask and filled up to the mark with deion. water.
ISA	$c(NaCl)$ = 3 mol/L 175.3 g sodium chloride is weighed into a 1 L volumetric flask and filled up to the mark with deion. water.

Analysis of samples

1 mL sample and 2 mL ISA are pipetted into the measurement vessel and diluted with 47 mL deion. water. The standard addition is carried out with $\beta(K^+)$ = 4 g/L. In between each measurement the electrode is conditioned for 30 s in $c(KCl)$ = 0.01 mol/L and then well rinsed with deion. water.

Parameters

Mode	STDADD auto
Number of additions	4
Volume auxiliary solution	49 mL
Stop volume	10 mL
Dosing rate	Medium
Delta U	15 mV
Signal drift	0.5 mV/min
Min. waiting time	10 s
Max. waiting time	300 s
Measuring interval	2.0 s
Stirring rate	8

Result

Sample	mg K^+ per 100 mL	s_{rel} / % (n = 5)
Orange juice	203.9	1.0
Apple juice	121.4	0.6
Red wine	124.9	0.6

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