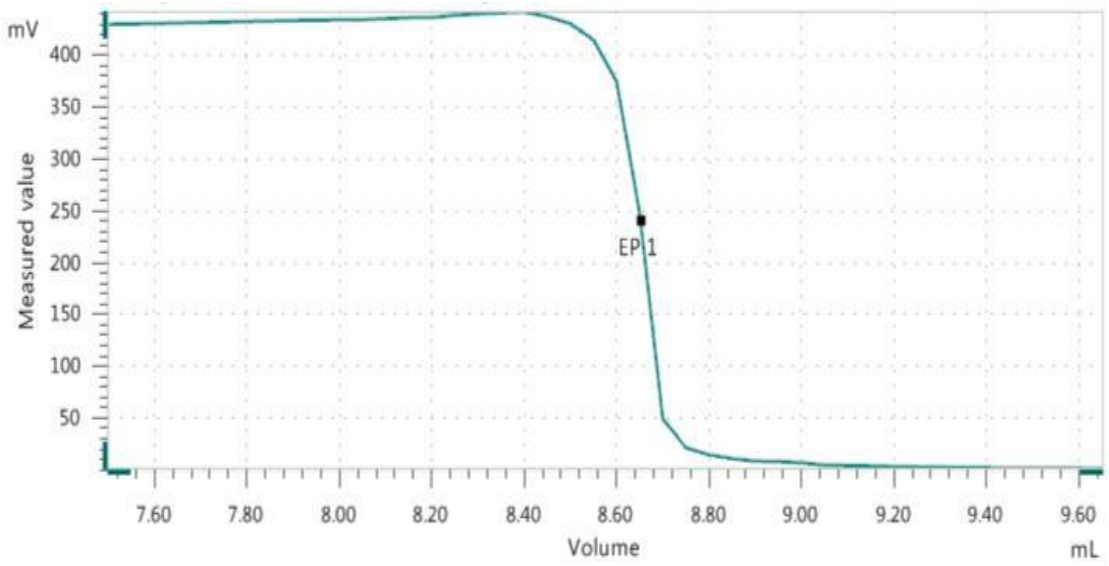
Titration Application Note T-162

Redox titration of vitamin C in orange juice using OMNIS



Vitamin C (ascorbic acid) is an important antioxidant and essential ingredient in numerous foodstuffs for which reason its content has to be precisely determined.

The OMNIS system facilitates a fast and accurate determination of vitamin C in orange juice by potentiometric titration with the double Pt-sheet electrode. Iodine is used as titrant.

Metrohm

Method description

Sample

Orange juice

Sample preparation

No sample preparation is required.

Configuration

OMNIS Sample Robot S with one Pick&Place module and pump module (2-channel)	2.1010.1010
OMNIS Titrator	2.1001.0010
OMNIS Dosing Module, 2x	2.1003.0010
Cable MDL St/Bu 1 m, 3x	6.02102.020
OMNIS 5 mL cylinder unit, 2x	6.03001.150
OMNIS 20 mL cylinder unit	6.03001.220
OMNIS Rod stirrer "Sample Robot"	2.1006.0010
Analog measuring module	6.02101.010
Electrode cable plug-in head G (pol.) / plug P, 1.5 m	6.02104.050
OMNIS Stand-alone license (including one instrument license), OMNIS 1.0	6.06003.010
Double Pt-sheet electrode	6.0309.100
OMNIS instrument license, 1x	6.06002.010

Solutions

Titrant	$c(I_2)$ = 0.01 mol/L, if possible this solution should be bought from a supplier.
Glyoxal solution	$w(C_2H_2O_2)$ = 40% with pH = 7.0, if possible this solution should be bought from a supplier.
Sulfuric acid	$c(H_2SO_4)$ = 1.0 mol/L, if possible this solution should be bought from a supplier.

Analysis

50 mL orange juice is pipetted into the titration vessel and placed on the rack. Just before the titration 2 mL glyoxal solution is automatically added to the sample. After a reaction time of 5 minutes, 5 mL sulfuric acid is automatically added and the solution is titrated with $c(I_2)$ = 0.01 mol/L until after the equivalence point using the double Pt-sheet electrode.

Parameters

Mode	MET Ipol
I(pol)	1.0 µA
Pause	30 s
Start volume	7.5 mL
Stirring rate	8
Volume increment	50 µL
Signal drift	50 mV/min
Max. waiting time	32 s
Min. waiting time	0 s
Dosing rate	Maximum
Stop volume	20 mL
Stop EP	1
Volume after EP	1.0 mL
EP criterion	30 mV
EP recognition	All

Results

Content β_{AA} / (mg/L) (n = 5)	s(rel) / %
303.8	0.44