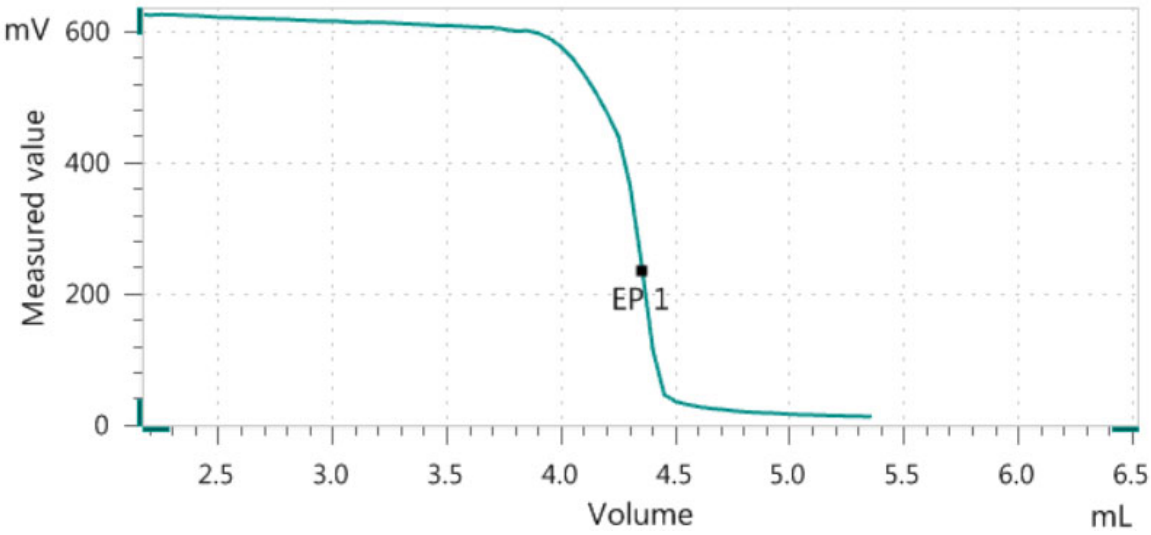
Titration Application Note T-171

Redox titration of vitamin C in milk powder using the double Au-ring electrode



Vitamin C is an important antioxidant included in milk powder. The double Au-ring electrode provides an excellent titration curve when using 2,6-dichlorophenolindophenol (DPIP) as titrant and is easy to clean.

With the OMNIS system, a fast and accurate determination of vitamin C in milk powder by a bi-voltametric titration is realized.

Metrohm

Method description

Samples

Milk powder (with 709 mg/kg ascorbic acid)

Sample preparation

16.4 g milk powder is weighed into a 1 L volumetric flask and dissolved in approximately 500 mL deionized water. The flask is then filled up to the mark with deionized water.

Configuration

Main module Pick&Place S	2.1010.0010
Pick&Place module	2.1014.0010
"Peristaltic" (2-channel) pump module	2.1016.0010
Gripper fingers 42.8 - 65 mm	6.02601.010
Dummy panel for module plate	6.02600.000
OMNIS Rod Stirrer "Sample Robot"	2.1006.0010
Stirring propeller 30 mm ETFE	6.01900.010
Titration head 3xNS14 / 4x6.4 mm (P&P)	6.01403.030
OMNIS Advanced Titrator	2.1001.0210
OMNIS 20 mL cylinder unit	6.03001.220
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)	6.06003.010
OMNIS instrument license, 1x	6.06002.010
Double Au-ring electrode	6.00353.100

Solutions

Titrant	β(DPIP) = 0.25 g/L

Analysis

50 mL milk powder solution is pipetted into the titration vessel and placed on the rack. The solution is titrated with β(DPIP) = 0.25 g/L until after the equivalence point.

Parameters

Mode	MET Ipol
I(pol)	1.0 µA
Pause	30 s
Stirring rate	8
Volume increment	50 µL
Signal drift	30 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	Greatest

Results

Sample	Ascorbic acid	s(rel) / %
Milk powder	0.086% (n = 5)	0.89