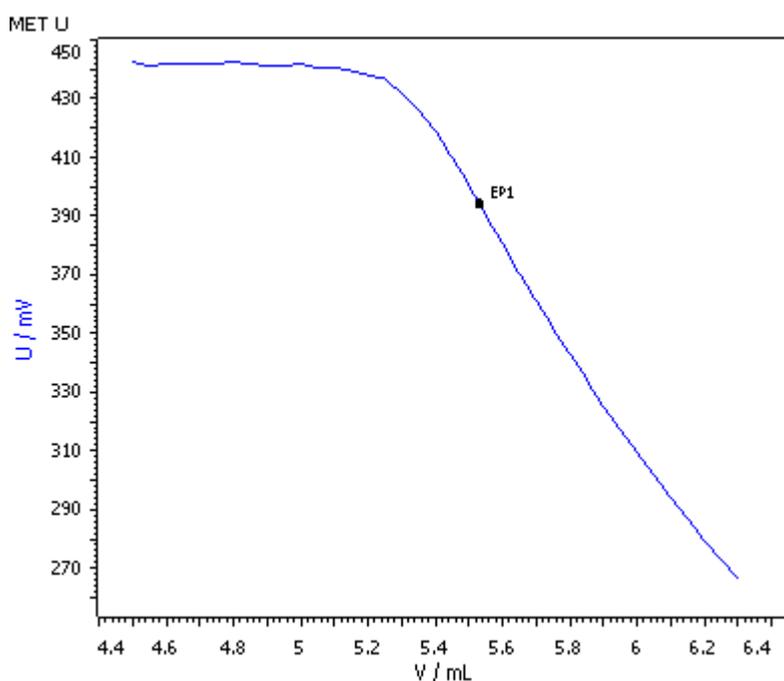


Titration Application Note T-86

Photometric determination of ascorbic acid (vitamin C) in orange juice according to ISO 6557-2



This Application Note describes the photometric determination of ascorbic acid according to the standard ISO 6557-2 using the Optrode (520 nm). 2,6-Dichlorophenol-indophenol simultaneously serves as titrant and indicator.

Method description

Sample

Orange juice

Blood orange juice

Sample preparation

To 10 mL juice 30 mL oxalic acid is added to extract the ascorbic acid. To remove the pulp the solution is then centrifuged (5000 rpm, 10 min).

Configuration

907 Titrand	2.907.0010
800 Dosino (2 x)	2.800.0010
Dosing unit 20 mL	6.3032.220
Dosing unit 50 mL	6.3032.250
801 Magnetic stirrer	2.801.0040
Outrode (at 520 nm)	6.1115.000

Solutions

2,6-Dichlorophenol-indophenol (DPIP) $\beta(\text{DPIP}) = 0.25 \text{ g/L}$	50 mg DPIP sodium salt dihydrate is dissolved in about 150 mL hot dist. water (50 – 60 °C) containing 42 mg sodium hydrogen carbonate. The solution is transferred into a 200 mL volumetric flask and made up to the mark with dist. H ₂ O. The solution can be stored up to one week in a brown glass bottle in a refrigerator. The titer of this solution has to be determined daily.
Oxalic acid solution $\beta(\text{H}_2\text{C}_2\text{O}_4) = 20 \text{ g/L}$	28 g oxalic acid dihydrate is weighed into a 1 L volumetric flask, dissolved in dist. H ₂ O. The flask is then filled up to the mark with dist. H ₂ O.

Analysis

An aliquot of the extracted sample solution (containing at least 0.2 mg ascorbic acid) is added into a titration beaker, 30 mL oxalic acid solution is added and the solution is then titrated with $\beta(\text{DPIP}) = 0.25 \text{ g/L}$ until after the first equivalence point using the Outrode at 520 nm.

For the blank determination, an aliquot of the extraction solution (here oxalic acid solution) is pipetted into a titration beaker, 30 mL oxalic acid solution is added and then titrated with $\beta(\text{DPIP}) = 0.25 \text{ g/L}$ until after the first equivalence point using the Optrode at 520 nm.

Parameters

Mode	MET U
Stirring rate	6
Start volume	0.5 mL
Pause	30 s
Signal drift	30 mV/min
Max. waiting time	32 s
Volume increment	0.05 mL
EP criterion	15 mV
EP recognition	greatest

Results

Results for orange juice (n = 3)

Mean content / (mg/L)	s(rel) / %
363.46	1.28

Results for blood orange juice (n = 3)

Mean content / (mg/L)	s(rel) / %
570.75	1.29