



Application Note AN-T-086

Vitamin C in orange juice

Photometric titration according to ISO 6557-2

Vitamin C, also known as ascorbic acid or L-ascorbic acid, is an essential nutrient involved in the repair of tissues and the enzymatic production of certain neurotransmitters. It is required for the functioning of several enzymes and immune performance, and is also an important antioxidant. This nutrient is found in many foods and is often used as a dietary supplement.

This Application Note describes the photometric determination of ascorbic acid according to the standard ISO 6557-2. To increase the objectivity on the determined equivalence point and the reproducibility of the results, an autotitrator equipped with a photometric sensor, the Optrode, is used. The titrant 2,6-Dichlorophenol-indophenol (DCIP or DPIP) simultaneously serves as titrant and indicator.

SAMPLE AND SAMPLE PREPARATION

The method is demonstrated for orange and blood orange juice.

First, oxalic acid is added to the sample.

EXPERIMENTAL

This photometric analysis is carried out on a 907 Titrand system equipped with a magnetic stirrer and an Optrode for indication purposes.

An aliquot of the prepared sample is added to the titration beaker, followed by oxalic acid. Then, the solution is titrated using standardized 2,6-Dichlorophenol-Indophenol (DPIP) until after the first equivalence point.

Afterwards, the sample is centrifuged to remove any pulp.



Figure 1. 907 Titrand with tiamo. Example setup for the photometric determination of vitamin C.

RESULTS

The analysis demonstrates acceptable and reproducible results and well-defined titration

curves. The results are summarized in **Table 1**. An example titration curve is displayed in **Figure 2**.

Table 1. Mean vitamin C content of orange juices determined by titration (n = 3).

Sample	Mean / mg/L	SD(rel) in %
Orange juice	363.5	1.28
Blood orange juice	570.8	1.29

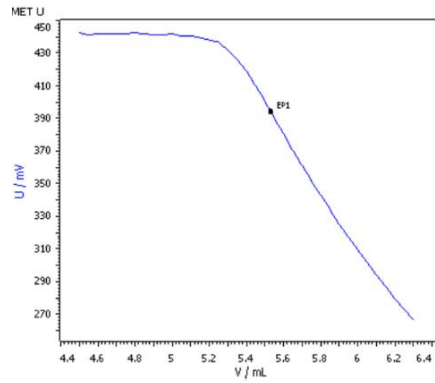


Figure 2. Example titration curve of the vitamin C determination in blood orange juice.

CONCLUSION

After sample extraction and centrifugation, the vitamin C content in orange juices is easily assessed according to **ISO 6557-2** by using DPIP as titrant and a photometric sensor for indication. In this manner, the salmon pink coloration of the endpoint can be reproducibly

and objectively determined regardless of the operator and sample color. Furthermore, using a photometric sensor enables the use of an automated system and with that, increased sample throughput.

Internal reference: AW TI CH1-1145-112013

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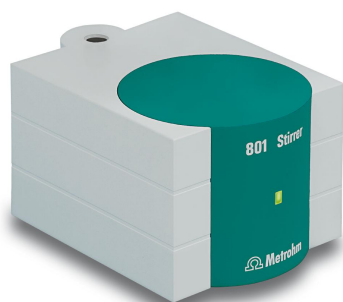
CONFIGURATION



907 Titrando

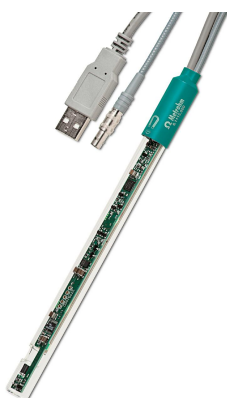
用于使用一个量接口和 Dosino 加液元位分析和容量-休滴定法滴定的高端滴定。

- 多四套 800 Dosino 加液系
- (DET)、等量(MET)和点滴定(SET),和 pH-STAT 滴定(STAT)、·休容量滴定(KFT)
- 使用子性量(MEAS CONC)
- 智能“iTrode”
- 控的加液功能,LQH
- 用于其他拌器或加液器系的四个 MSB 接口
- USB 接口
- 使用 OMNIS-Software、*tiamo*-件或 Touch Control
- 如果需要,足 GMP/GLP 和 FDA 要求,比如 21 CFR 第 11 部分



801 Stirrer

磁力拌器包括底、支架杆和座,可用于 Titrino plus、Dosimat plus、Titrando、Sample Processor、805 Dosimat 和 780/781 pH Meter 以及 856 和 867 量模。有固定安装的、用于 MSB(万通串行接口)的。



Optrode

有 8 可用波的光度滴定用光学传感器。可以通件控制 (*tiamo* 2.5 及以上版本)或通磁来行波切。玻璃鞘溶完全耐受,并且易于清。省空的传感器用于,例如:

- 按照 USP 或 EP 的非水溶性滴定
- 基端基的定
- TAN/TBN 根据 ASTM D974
- 硫酸定
- 混凝土中的 Fe、Al、Ca
- 水硬度
- 根据 USP 的硫酸骨素

传感器不合通量色度(比色法)来定度。