Application Note AN-T-109

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Achieve faster results with the modified standard method

SUMMARY

The iodine number is an important sum parameter for assessing the quality of edible oils and fats. It provides quantitative information about the presence of unsaturated fats and oils. The higher the amount of unsaturated fatty acids in the sample, the more iodine reacts with these double bonds, resulting in a higher iodine value. For common oils, such as sunflower or olive oil, the iodine value is well known. Hence, it can be used as a test parameter for counterfeit detection in the fight against food fraud.

For the classical titrimetric determination, the samples have to be placed in the dark for up to two hours after the addition of the reaction solution (Wijs solution). In this Application Note, we describe a modified analysis based on EN ISO 3961, ASTM D5554, AOAC 920.159, AOAC 993.20, AOCS Cd 1d-92, USP<401> Method II, and Ph.Eur. 2.5.4 Method B. Due to the modification, the reaction time reduces significantly, from 2 hours to 5 minutes. This modified analysis thus allows for much higher productivity in the lab.

Find more information in the video:

SAMPLE AND SAMPLE PREPARATION

The analysis is demonstrated on canola (rapeseed) oil and olive oil. No sample preparation is required.

EXPERIMENTAL

The analysis is carried out automatically on an OMNIS system consisting of an OMNIS Sample Robot S and an OMNIS Titrator. The maintenance-free dPt Titrode is used for indication of the equivalence point.

An appropriate amount of sample is weighed into the titration beaker, then the beaker is covered with a lid and placed on the sample rack. Before the titration, glacial acetic acid, Wijs solution (ICl), and magnesium acetate solution are added and the solution is stirred for 5 minutes. Afterwards, potassium iodide solution is added and the solution is titrated with standardized sodium thiosulfate until after the equivalence point.

Figure 1. Example of an OMNIS system consisting of an OMNIS Sample Robot S with two working stations, an OMNIS Professional Titrator, and a corresponding amount of OMNIS Dosing Modules to add all necessary solutions.

RESULTS

Sharp titration curves are obtained where the equivalence point is reliably determined by the OMNIS software.

Table 1. Mean iodine value for canola (rapeseed) oil and olive oil determined with an automated OMNIS system (n = 5).

	Canola oil	Olive oil
Iodine value in g I_2/g	109.3	80.9
SD(rel) in %	0.1	0.1

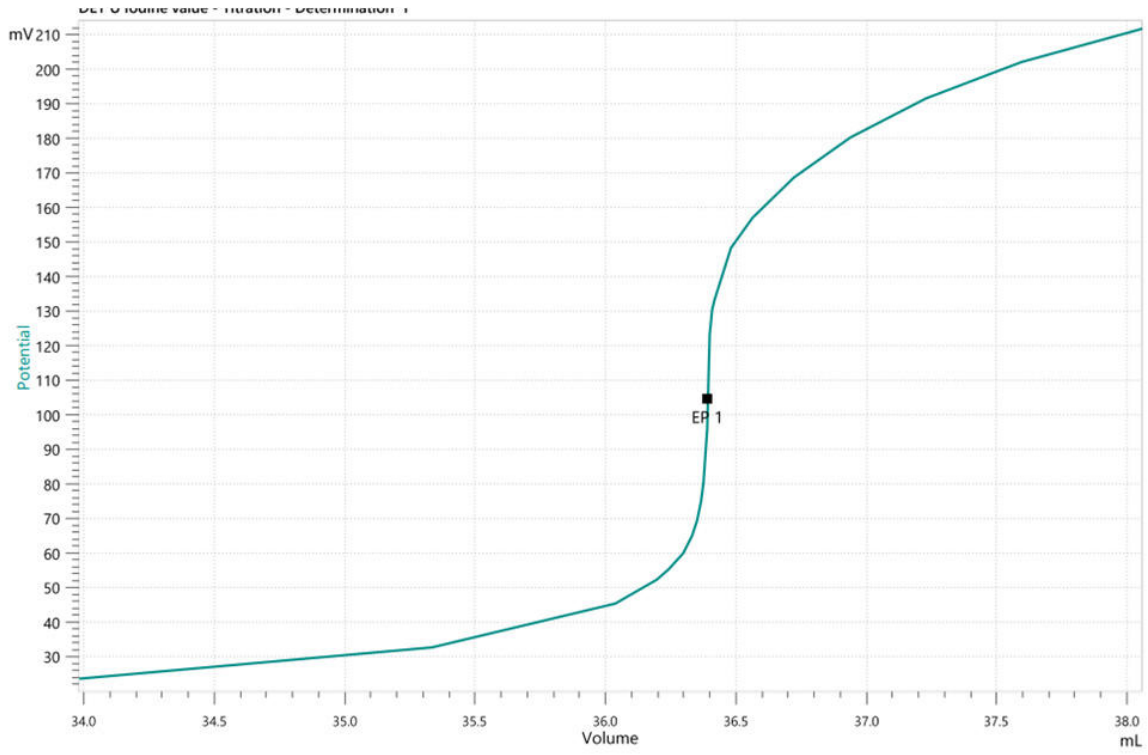


Figure 2. Titration curve of the determination of the iodine value in olive oil with the described OMNIS System.

CONCLUSION

The standards EN ISO 3961, ASTM D5554, AOAC 920.159, AOAC 993.20, AOCS Cd 1d-92, USP<401> Method II, and Ph.Eur. 2.5.4 Method B describe a procedure which needs a reaction time of 2 hours. Here, we show a reliable way to determine the iodine value in oils and fats within just a few minutes. This significantly enhances sample throughput and reduces the cost per analysis. With an OMNIS system, the analyses can even be carried out in parallel so that laboratory throughput can be enhanced even further.

CONTACT

瑞士万通中国
北京市海淀区上地路1号院
1号楼7702
100085 北京

marketing@metrohm.com.cn

CONFIGURATION

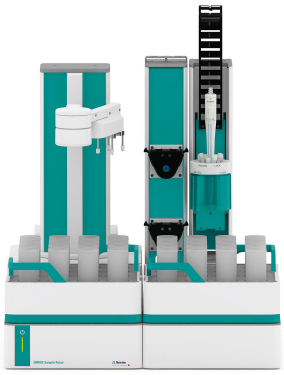
OMNIS Professional Titrator

新型、模式位分析 OMNIS Titrator,用于行点和等当点滴定(一/)。由于采用 3S OMNIS Liquid Adapter 技,理化学品从未像在一安全。可以使用量模和量管元自由配置滴定,并在需要展一台拌器。包括用于使用其他滴定或加液模平行滴定的"Professional"功能可。

- 通算机或本地网控制
- 可以其他用或助溶液外接最多四个滴定模或加液模
- 可以展磁力拌器和/或棒式拌器
- 可提供不同大小的量管:5、10、20 或 50 mL
- 采用 3S 技的 OMNIS Liquid Adapter:安全理化学品,自生厂家的原始数据

量模式和件:

- 点定滴定:"Basic" 功能可
- 点和等当点滴定(一/):"Advanced" 功能可
- 点和等当点滴定(一/),包括 5 路平行滴定:"Professional" 功能可



OMNIS Sample Robot S Pick and Place

OMNIS Sample Robot S 具有一个"蠕"模(2 通道)和一个 Pick&Place 模以及大量附件,可直接入全自滴定。此系具有个品位置,可用于 32 个 120 mL 的品。此模化系供已完全安装完,因此可在短内投入行。

系也可根据需要展配外台蠕以及多加一个 Pick&Place 模,由此使通量翻倍。如果需要更多工作台,可将此 Sample Robot 展 L 格款型的 OMNIS Sample Robot,由此可使七个品的品在多四个 Pick&Place 模上并行理,将品通量大四倍。

dPt Titrode

pH 玻璃膜的 OMNIS 用数字合式形,用作参比。

免用于 pH 恒定的化原滴定,例如:

- 量法
- 重酸法
- 量法
- 高酸滴定法

存放在蒸水中。

dTrodes 可在 OMNIS Titratoren 上使用。