



Application Note AN-T-110

食用油中的过氧化值

Fully automated determination according to the current EN ISO, AOAC, Ph. Eur, and USP standards

The peroxide number or peroxide value is an important sum parameter for assessing the quality of edible fats and oils. It provides quantitative information about the presence of peroxides or hydroperoxides, which are formed when unsaturated fatty acids in fats and oils react with oxygen. Peroxide and hydroperoxides can lead to a rancid taste in oils, thus the peroxide number provides information about the freshness of the sample.

This Application Note describes the titrimetric determination of the peroxide value in canola and olive oil according to EN ISO 27107, EN ISO 3960, AOAC 965.33, Ph.Eur. 2.5.5, as well as USP<401>. Using the DIS-Cover technique all sample preparation steps can be fully automated, freeing up valuable time of the operator and thus increasing the productivity in the lab.

Find more information in the video:

SAMPLE AND SAMPLE PREPARATION

The method is demonstrated for two different edible oils: canola oil (rapeseed oil) and olive oil.

For both samples, no sample preparation is necessary.

EXPERIMENTAL

This analysis is carried out on an automated system consisting of an OMNIS Advanced Titrator and an OMNIS Sample Robot S with Dis-Cover equipped with a dPt Titrode (Figure 1). To a reasonable amount of sample, solvent mixture and auxiliary solution are automatically added and the solution is stirred for 1 minute to complete the reaction. Deionized water is added and the sample is titrated with standardized titrant until after the equivalence point is reached.

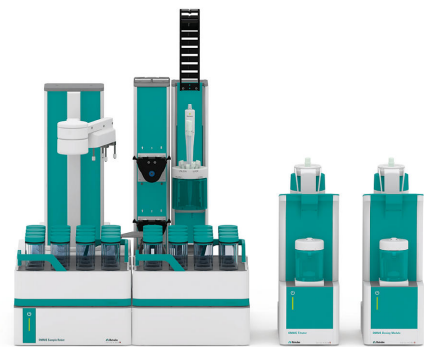


Figure 1. Sample Robot with Dis-Cover functionality, Dosing module and OMNIS Advanced Titrator equipped with dPt Titrode for the determination of peroxide value.

RESULTS

The analysis demonstrates acceptable results with SD(rel) < 2% and well defined titration curves. The results and an example titration

curve are displayed in Table 1 and Figure 2, respectively.

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

	Canola oil	Olive oil
Peroxide value in mq O ₂ /kg	1.9	6.4
SD(rel) in %	1.05	0.86

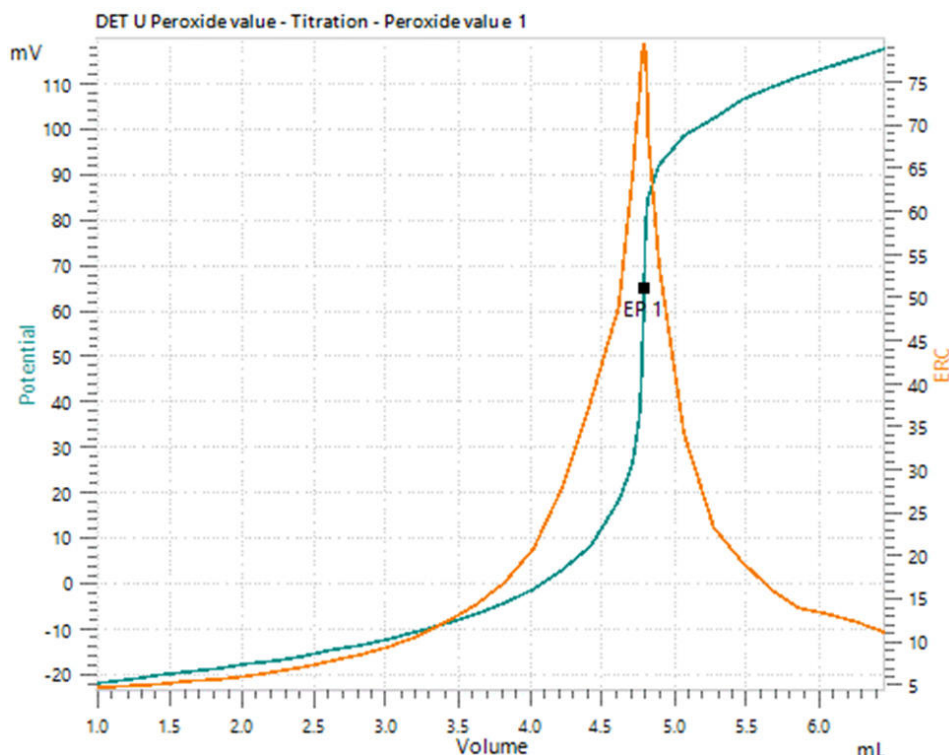


Figure 2. Example titration determination in olive oil.

CONCLUSION

Titration is a precise and reliable method to determine the peroxide value in various edible oils according to various international standards. Using an OMNIS Sample Robot with Dis-Cover functionality allows a fully automated determination of up to four samples simultaneously, freeing up valuable time of the

operator and thus increasing the productivity in the lab. The OMNIS system offers the opportunity to customize the system according to your needs and expand it for other required titration applications on edible oils, such as the acid value or iodine value.

CONTACT

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CONFIGURATION



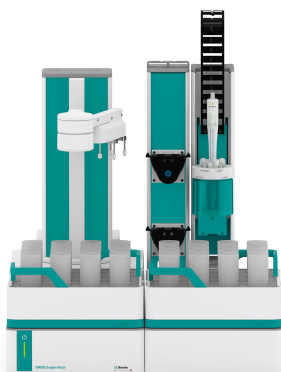
OMNIS Professional Titrator

创新型、模块式电位分析 OMNIS Titrator,用于进行终点和等当点滴定(单一/动态)。由于采用 3S OMNIS Liquid Adapter 技术,处理化学品从未像现在一样安全。可以使用测量模块和计量管单元自由配置滴定仪,并在需要时扩展一台搅拌器。包括用于使用其他滴定或加液模块平行滴定的“Professional”功能许可证。

- 通过计算机或本地网络控制
- 可以为其他应用或辅助溶液另外连接最多四个滴定模块或加液模块
- 可以扩展磁力搅拌器和/或棒式搅拌器
- 可提供不同大小的计量管:5、10、20 或 50 mL
- 采用 3S 技术的 OMNIS Liquid Adapter:安全处理化学品,自动传输生产厂家的原始试剂数据

测量模式和软件选项:

- 终点设定滴定:“Basic” 功能许可证
- 终点和等当点滴定(单一/动态):“Advanced” 功能许可证
- 终点和等当点滴定(单一/动态),包括 5 路平行滴定:“Professional” 功能许可证



OMNIS Sample Robot S Pick and Place

OMNIS Sample Robot S 具有一个“蠕动”泵模块(2通道)和一个 Pick&Place 模块以及大量附件,可直接进入全自动滴定。此系统具有两个样品盘位置,可用于 32 个 120 mL 的样品盘。此模块化系统供货时已完全安装完毕,因此可在极短时间内投入运行。

该系统也可根据需要扩展配备另外两台蠕动泵以及多加一个 Pick&Place 模块,由此使通量翻倍。如果需要更多工作台,则可将此 Sample Robot 扩展为 L 规格款型的 OMNIS Sample Robot,由此可使七个样品盘的样品在多达四个 Pick&Place 模块上并行处理,将样品通量扩大四倍。



dPt Titrode

带 pH 玻璃膜的 OMNIS 用数字组合式铂环形电极,用作参比电极。

该免维护电极适用于 pH 值恒定的氧化还原滴定,例如:

- 碘量法
- 重铬酸钾法
- 铈量法
- 高锰酸盐滴定法

该电极存放在蒸馏水中。

dTrodes 可在 OMNIS Titratoren 上使用。