



Application Note AN-T-111

食用油的皂化值

Fully automated determination in canola and olive oil according to EN ISO, ASTM, AOAC, USP, and Ph.Eur.

The saponification value is an important parameter used for the characterization and assessment of the quality of edible fats and oils. Furthermore, the saponification number provides information about the average molecular weight of all fatty acids present. The higher the saponification value, the lower the molecular weight of all fatty acids.

This Application Note describes the titrimetric

determination of the saponification value in rapeseed (canola) and olive oil. The analysis is performed according to the standard EN ISO 3657, and is based on a modification of the norms AOAC 920.160, ASTM D5558, USP<401>, and Ph.Eur. 2.5.6. Using potentiometric indication, very precise results can be achieved for a wide range of edible oils.

Find more information in the video:

SAMPLE AND SAMPLE PREPARATION

The analysis is demonstrated for olive and canola (rapeseed) oil.

An appropriate amount of sample is weighed into a conical flask and refluxed with ethanolic

potassium hydroxide solution for 60 minutes. For the blank determination, the same procedure is applied but the sample is omitted.

EXPERIMENTAL

The analysis is carried out on an OMNIS system consisting of an OMNIS Advanced Titrator, an OMNIS Dosing Module, and a dSolvotrode.

The prepared sample solution is first allowed to cool down to room temperature. Next, the buret tips as well as the electrode are inserted into the conical flask. Ethanol is added, and then the solution is titrated with standardized hydrochloric acid until after the equivalence point is reached. Afterwards, the electrode is cleaned with ethanol and deionized water. The electrode is then conditioned by immersing the bulb alone in deionized water for 1 minute.

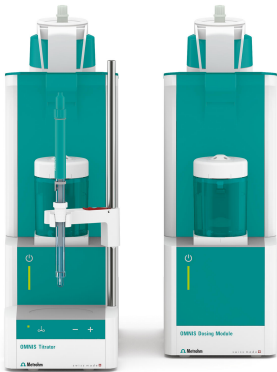


Figure 1. OMNIS system for the measurement of saponification value in edible oils consisting of an OMNIS Advanced Titrator and an OMNIS Dosing Module equipped with a dSolvotrode.

RESULTS

Steep and smooth curves are obtained for both oils. The results are very reproducible with

relative standard deviations below 0.3 %. The results for the two oils are displayed in **Table 1**.

Table 1. Results of the saponification number (SN) for canola oil and olive oil (n = 5).

Sample (n = 5)	SN / (mg KOH/g)	SD(rel) / %
Canola oil	190.75	0.3
Olive oil	193.52	0.2

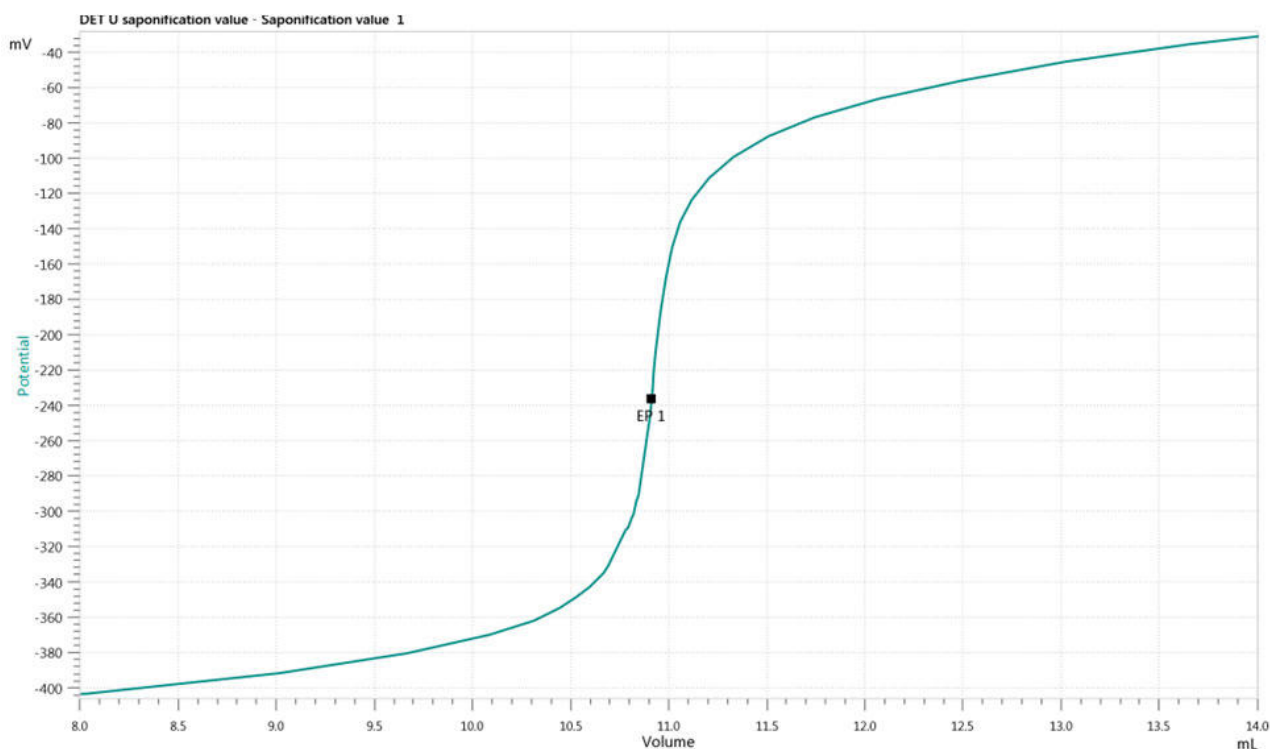


Figure 2. Titration curve of the determination of the saponification number of canola (rapeseed) oil.

CONCLUSION

The saponification number in a variety of edible oils is easily determined using automated potentiometric titration according to the standard **EN ISO 3657**. The dSolvotrode used in

this application was designed especially for nonaqueous titrations and leads, together with the ONMIS system, to unmatched precision.

CONTACT

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CONFIGURATION



OMNIS Professional Titrator

创新型、模块式电位分析 OMNIS Titrator,适于独立运行或作为 OMNIS 滴定系统的核心元件运行,用于终点和等当点滴定(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棒式搅拌器。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
- 棒式搅拌器的连接方式
- 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 Dosing Module

用于与 OMNIS Titrator 滴定仪相连的加液模块,以扩展额外用于滴定/加液的滴定管。可以扩展磁力搅拌器和/或螺旋搅拌器,以作为单独的滴定台使用。可自由选择 5、10、20 或 50 mL 计量管单元。



dSolvotrode

用于所有非水性酸/碱滴定的 OMNIS 数字组合式 pH 电极。玻璃膜针对导电性差的溶液进行了优化,并且由于灵活的磨口隔膜,该电极也适用于非常脏的样品。

此电极可与非水参比电解质(氯化锂或四乙基溴化铵)一起使用。

储存在相应的参比电解质中。

dTodes 可在 OMNIS Titratoren 上使用。