



Application Note AN-T-111

Saponification value of edible oils

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.

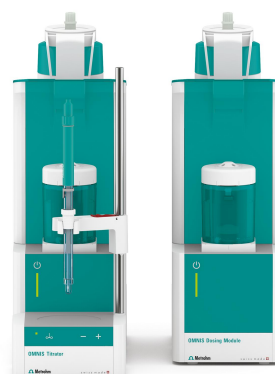


Figure 1. OMNIS system for the measurement of saponification value in edible oils consisting of an OMNIS Advanced Titrator and an OMNIS Dosing Module equipped with a dSolvotrode.

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

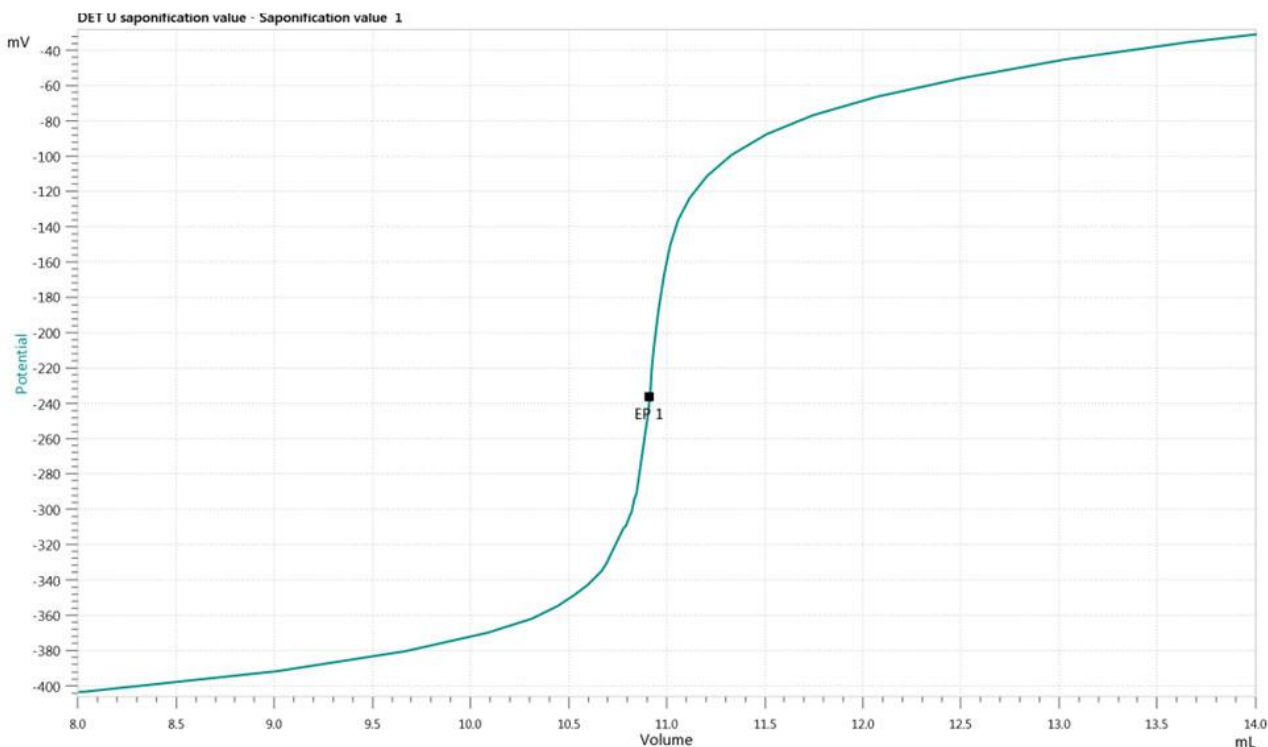


Figure 2. Titration curve of the determination of the saponification number of canola (rapeseed) oil.

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.

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CONFIGURATION



OMNIS Professional Titrator

新型、模式位分析 OMNIS Titrator 滴定,于独立行或作 OMNIS 滴定系的核心元件行,用于使用 OMNIS Sample Robot 行点和等当点滴定(一/)。由于采用 3S 瓶配器技,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,并在需要展一台螺旋拌器。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
- 螺旋拌器的接方式
- 可提供不同大小的量管:5、10、20 或 50 mL
- 采用 3S 技的瓶配器:安全理化学品,自生商的原始数据

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/),包括平行滴定:“Professional” 功能可



OMNIS Dosing Module

用于与 OMNIS Titrator 滴定相的加液模,以展外用于滴定/加液的滴定管。可以展磁力拌器和/或螺旋拌器,以作独的滴定台使用。可自由 5、10、20 或 50 mL 量管元。



dSolvotrode

用于所有非水性酸/滴定的 OMNIS 数字合式 pH。玻璃膜性差的溶液行了化,并且由于活的磨口隔膜,也用于非常的品。

此可与非水参比解(化或四乙基化)一起使用。存在相的参比解中。

dTrodres 可在 OMNIS Titratoren 上使用。