



Application Note AN-T-110

Peroxide value in edible oils

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 $SD(\text{rel}) < 2\%$ 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 $\text{mq O}_2/\text{kg}$	1.9	6.4
$SD(\text{rel})$ in %	1.05	0.86

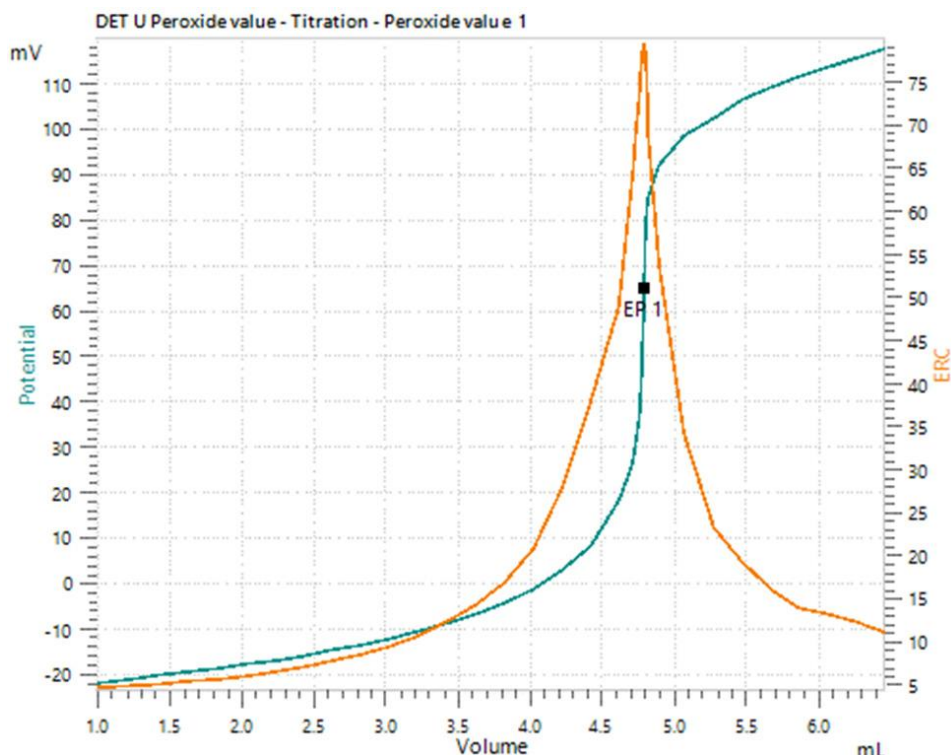


Figure 2. Example titration determination in olive oil.

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.

Internal reference: AW TI CH1-1277-062019

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