Application Note AN-R-028

Oxidation stability of flavored spirits using PEG as carrier material

Reliable and accurate determination of the oxidation stability of flavored spirits with the polyethylene glycol method

Distilled alcohol is otherwise known as «hard liquor» or «spirits». Classic spirits are often mixed with different flavors in order to reach new customers – thereby expanding a brand's market share. One such spirit, gin, is distilled from juniper berries and contains no additives. However, raspberry and blackberry flavored gin is also available. Such flavor additives often contain antioxidants and can affect the shelf life of the product. Using the Rancimat method with polyethylene glycol (PEG) as carrier material, the oxidation stability of flavored and unflavored gin can be determined quickly and reliably. The sample is analyzed without any preparation, and the induction time can be related directly to the oxidation stability of the sample.

This Application Note demonstrates the feasibility of the Rancimat method. Reproducible and accurate determination of the oxidation stability of flavored spirits is possible with the 892 Professional Rancimat.

SAMPLE AND SAMPLE PREPARATION

This application is demonstrated on different flavored and unflavored (plain) gins. No sample preparation is required.

EXPERIMENTAL

First, an appropriate amount of gin and PEG are weighed into the reaction vessel, and then the analysis is started.

The Rancimat method exposes the sample to an airflow at a constant temperature between 100–180 °C. Highly volatile secondary oxidation products are transferred with the airflow into the measuring vessel where they are absorbed in the measuring solution. Here, the conductivity is continuously measured since the secondary oxidation products lead to an increase in the conductivity. The time until occurrence of this marked conductivity increase is referred to as the «induction time», which is a reliable indicator for the oxidation stability (Figure 1).

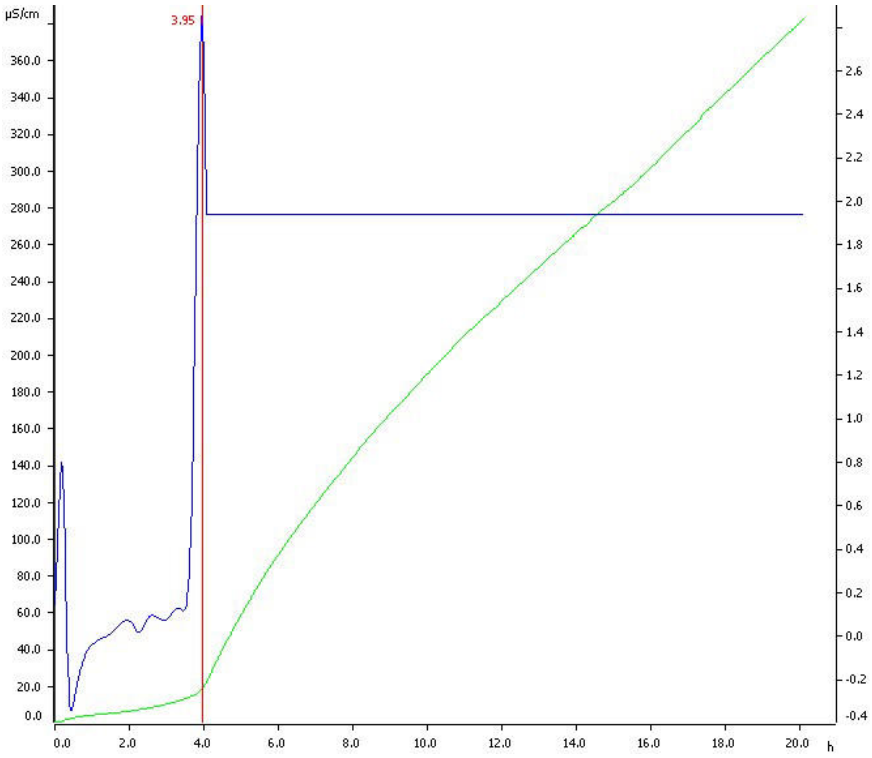

Figure 1. Determination of the oxidation stability of a flavored gin (Table 1, sample 4). Induction time is determined at 3.95 h.

Table 1. Summarized results for oxidation stability of different flavored and unflavored gins.

Sample	Mean value in hours	SD(rel) in %
1 (flavored, n = 4)	5.04	3.6
2 (flavored, n = 4)	4.20	3.5
3 (flavored, n = 6)	2.89	7.0
4 (flavored, n = 6)	3.87	4.0
5 (flavored, n = 6)	5.60	3.3
6 (unflavored, n = 4)	0.52	1.1
7 (unflavored, n = 4)	0.52	1.5

CONCLUSION

Most flavored spirits can be measured directly with the Rancimat for their oxidation stability in order to guarantee a consistent high quality of the finished product. With the Rancimat, this parameter can easily and simultaneously be determined on eight different samples at a time.

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CONFIGURATION

892 Professional Rancimat

The 892 Professional Rancimat is an analysis system for the simple and safe determination of the oxidation stability of natural fats and oils with the well-established Rancimat method. With eight measuring positions in two heating blocks. The built-in display shows the status of the instrument and each individual measuring position. Start buttons for every measuring position enable the measurement start on the instrument. Cleaning effort can be reduced to a minimum through the use of practical disposable reaction vessels and dishwasher-safe accessories. This saves time and costs and significantly improves accuracy and reproducibility.

All accessories necessary for carrying out determinations are included in the scope of delivery. The StabNet software is required for instrument control, data recording and evaluation and for data storage.