Application Note AN-T-132

Titratable acidity in milk and yogurt

Accurate determination according to DIN 10316, ISO/TS 11869, and IDF/RM 150

The titratable acidity gives an indication of the freshness of milk and yogurt as well as other fermented milk products. The determined titratable acidity in milk is mainly given through the absorption of hydroxyl ions by milk proteins and milk salts. The acidity increases with bacterial acidification and with enzymatic lipolysis.

The titratable acidity corresponds to the amount of sodium hydroxide required to titrate 100 g sample to a pH value of 8.30.

In this Application Note, an easy and accurate method to determine the titratable acidity in milk according to DIN 10316 and in yogurt according to ISO/TS 11869 and IDF/RM 150 is demonstrated.

SAMPLE AND SAMPLE PREPARATION

The method is demonstrated for UHT milk and natural yogurt. The samples are prepared according to the standard.

EXPERIMENTAL

This analysis is performed on a 905 Titrando equipped with a magnetic stirrer and a Porotrode for pH measurement.

Prior to the analysis, the Porotrode must be calibrated in order to ensure accurate results.

A reasonable amount of milk or prepared yogurt sample is used for the titration. An endpoint titration is carried out with standardized sodium hydroxide to a pH value of 8.3.

Figure 1. 905 Titrando with tiamo. Example setup for the determination of the titratable acidity in dairy products.

RESULTS

The analysis demonstrates acceptable and reproducible results. The results are summarized in Table 1. An example titration curve is displayed in Figure 2.

Table 1. Mean titratable acidity of a milk and a yogurt sample determined with a Titrando system (n = 5).

Sample	Mean titratable acidity	SD(rel) in %
Milk	144.40 mL c(NaOH) = 0.1 mol per L milk	0.28
Yogurt	12.87 mmol NaOH / 100 g	0.17

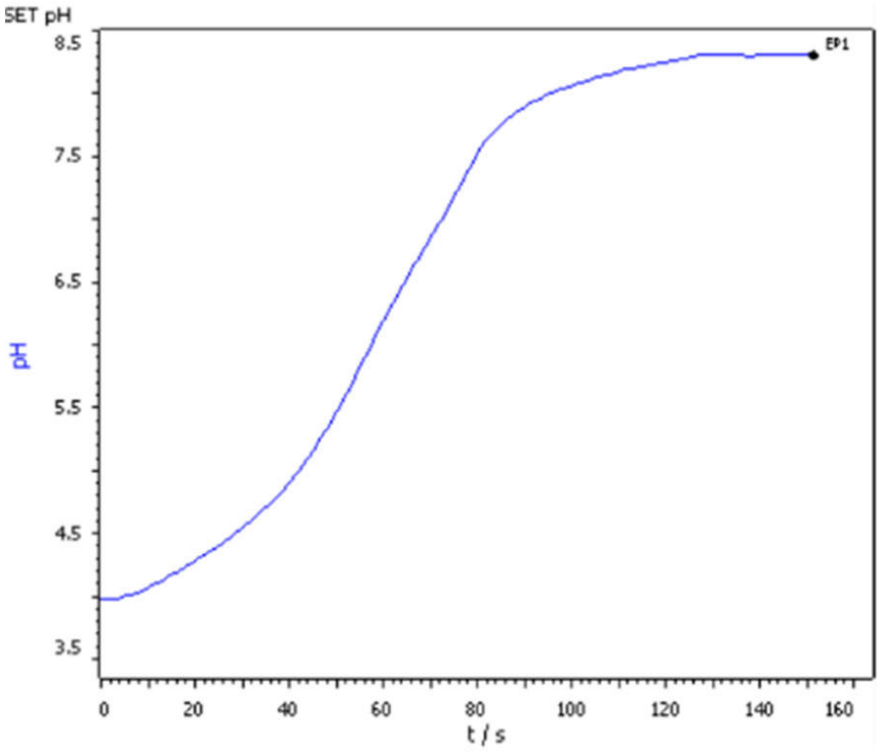

Figure 2. Example titration curve of the determination of titratable acidity in a dairy product.

CONCLUSION

After sample preparation, the determination of the titratable acidity can be performed reliably and cost-efficiently by using a Metrohm autotitrator. Fast and precise determination according to DIN 10316, ISO/TS 11869, and IDF/RM 150 is possible.

Internal reference: AW TI CH1-1156-042014

CONTACT

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CONFIGURATION

905 Titrando

High-end titrator for potentiometric titration with one measuring interface for use with Dosino dosing systems.

- up to four dosing systems of the 800 Dosino type
- dynamic (DET), monotonic (MET), and endpoint titration (SET)
- Measurement with ion-selective electrodes (MEAS CONC)
- Dosing functions with monitoring, Liquid Handling
- four MSB connectors for additional stirrers or dosing systems
- "iTrode" intelligent electrodes
- USB connector
- For use with OMNIS Software, *tiamo* software, or Touch Control unit
- Compliance with GMP/GLP and FDA regulations such as 21 CFR Part 11, if required

Porotrode

Combined pH electrode for pH measurement / titration of:

- protein-containing samples (foodstuffs, biological samples)
- heavily contaminated samples
- viscous samples

The specially developed capillary diaphragm and the reference electrolyte porolyte (6.2318.000) enable an optimum performance in samples containing protein. Storage in storage solution.