

Application Note AN-T-132

牛奶和酸奶中的可滴定酸度

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.

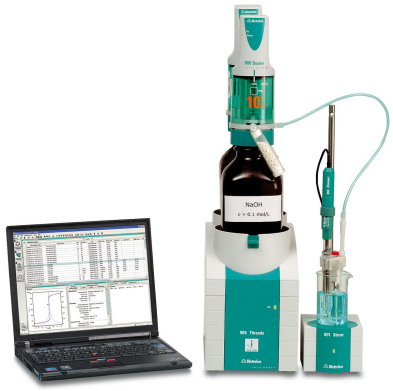


Figure 1. 905 Titrando with tiamo. Example setup for the determination of the titratable acidity in dairy products.

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

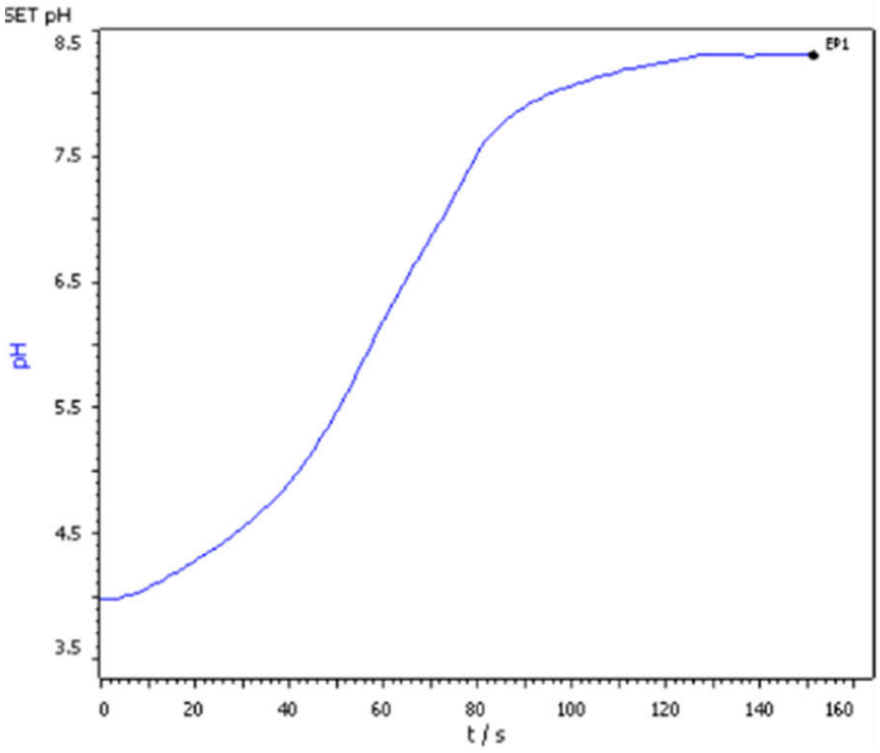


Figure 2. Example titration curve of the determination of titratable acidity in a dairy product.

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.

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CONFIGURATION



905 Titrando

用于使用 Dosino 加液系统通过一个测量接口滴定分析的电位滴定仪。

- 多达四套 800 Dosino 加液系统
- 动态等当点滴定(DET)、等量等当点滴定(MET)和终点设定滴定(SET)
- 使用离子选择性电极测量(MEAS CONC)
- 带监控的加液功能,LQH
- 用于额外搅拌器或加液器系统的四个 MSB 接口
- 智能电极“iTrode”
- USB 接口
- 使用 OMNIS-Software、*tiamo*-软件或 Touch Control
- 如果需要,满足 GMP/GLP 和 FDA 要求,比如 21 CFR 第 11 部分



Porotrode

组合 pH 电极用于 pH 测量/滴定:

- 含蛋白质的样品(食物、生物样品)
- 严重污染的样品
- 粘性样品

专门开发的毛细管隔膜和参比电解质 Porolyt (6.2318.000) 可在含蛋白质的溶液中实现性能。存放在保存液中。