A 19 a - Titratable Acidity

GEA NIRO® Method No. A 19 a
Revised: January 2024

1. Principle

The titratable acidity is expressed as % lactic acid and is determined by titration of a known amount of reconstituted milk with 0.1 N NaOH using phenolphthalein as indicator.

2. Scope

This method may be applied for all kind of dried milk products.

3. Apparatus

1. Analytical balance ± 0.1 mg
2. Methrom autoburette
3. Solubility index mixer, Snijders, The Netherlands.
   Speed 3800-4000 rpm
4. 100 ml Erlenmeyer flask
5. 20 ml pipette, other sizes may be used

4. Chemicals

1. Titrisol, 0.1 N NaOH - R 35, and S 26, 27, 37/39
   R ≈ϒDK risk sentences
   S ≈ DK safety sentences
2. Phenolphthalein
3. 96% Ethanol

5. Reagents

0.1 N NaOH.

Dilute the Titrisol solution to 1 litre. Standard Method no. R-7.1

2. 1 % Phenolphthalein solution

Dissolve 1g of phenolphthalein in 50 ml 96% ethanol and dilute to 100 ml with deionized water.

6. Procedure

1. Disperse and dissolve the following amount of powder in 100 ml of deionized water using the mixer.

Powder:

Skim or buttermilk:	10 g
Whole milk:	13 g
Whey:	6 g

2. Allow the mixture to stand for approx. 1 hour, stir gently.

3. Pipette 20 ml into a 100 ml Erlenmeyer flask.

4. Add 0.5 ml of phenolphthalein and titrate with 0.1 N NaOH until a faint pink colour persists for 30 sec.

7. Result

$$\% \text{ titratable acidity} = \frac{ml \times N \times 90 \times 100}{V \times 1000}$$

where

ml	=	ml 0.1 NaOH used
N	=	Normality of 0.1 N NaOH
V	=	ml milk solution used

Titratable acidity is expressed as % lactic acid, (CH_3-CHOH-COOH, MW = 90)

Reproducibility ± 0.01% lactic acid

8. Remarks

1. Ref. 1 (ADMI) prescribes that exactly 17.6 ml of milk solution is used.
If that is the case the Titratable Acidity can be calculated by dividing ml 0.1 N NaOH by 20.

2. Adjust the amount of milk used in the titration until a reasonable amount of base is used.

9. Reference

- ADMI, Standards for grades of dry milk, bulletin 916, revised 1990
- GEA Niro Research Laboratory