A 19 a - Titratable Acidity

**GEA Niro Method No. A 19 a**

Revised: September 2006

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 $\approx$ DK risk sentences
      S $\approx$ DK safety sentences
   2. Phenolphthalein
   3. 96% Ethanol

5. **Reagents**
   1. 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**

\[
\text{% titratable acidity} = \frac{m_l \times N \times 90 \times 100}{V \times 1000}
\]

where

- \(m_l\) = ml 0.1 NaOH used
- \(N\) = Normality of 0.1 N NaOH
- \(V\) = ml milk solution used

Titratable acidity is expressed as % lactic acid, \((\text{CH}_3\text{-CHOH-COOH}, \text{MW} = 90)\)

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

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