**Expt. No.: 07**

**Experiment Name: Test for Acidity in Milk by Titration Method.**

**Titrable Acidity of Milk**

**Principle:** The titrable acidity test is employed to ascertain if milk is of such a high acidity as to reduce its keeping quality and heat stability. The acidity of milk is of two kinds.  
i. **Natural acidity** which is due to citrates and phosphates present in the milk and dissolved CO2 during the process of milking and thereafter.  
ii. **Developed acidity** which is due to lactic acid produced by the action of bacteria on lactose in milk.  
Generally the acidity of milk means the total acidity (Natural + developed) or titrable acidity. It is determined by titrating a known volume of milk with standard alkali to the point of an indicator like phenolphthalein.  
  
The titrable acidity test measures the amount of alkali which is required to change the pH of milk from its initial value of about 6-6 to 6.8, to the pH of the colour change of phenolphthalein added to milk to indicate the end point (pH 8.3). In fact, the method measures the buffering capacity of milk and not the true acidity.

**Objectives of this experiment:**

* Determine whether the milk is freshly drawn or not
* Get an idea about the extent of lactic fermentation in milk
* Check the fitness of milk to be used for manufacturing of different dairy products like cheese, butter, ice cream etc.
* Have an idea whether the milk is suitable for high heat treatment viz. pasteurization, sterilization etc.

**Apparatus:**

* 17.6-mL Babcock pipette
* 125-mL white porcelain cup or casserole
* Glass stirring rod ¼ inch X 4 inch
* 25-mL burette (graduated in 0.1 mL divisions) with pinchcock and burette stand with clamp
* One mL dropping pipette in a 30-mL bottle

**Reagents:**

* Indicator – one per cent solution of phenolphthalein in 50 per cent alcohol.
* N sodium hydroxide (0.1 N NaOH) called alkali solution.

**Procedure:**   
1. Fill the burette with 0.1N NaOH solution.  
2. Mix the milk sample thoroughly by avoiding incorporation of air.  
3. Transfer 10 ml milk with the pipette in conical flask.  
5. Add equal quantity of glass distilled water.  
6. Add few drops of phenolphthalein indicator solution\* and stir with glass rod.  
7. Take the initially reading of the alkali in the burette at the lowest point of meniscus.  
8. Rapidly titrate the contents with 0.1N NaOH solution continue to add alkali drop by the drop and stirring the content with glass rod till first definite change to pink colour which remains constant for 10 to 15 seconds.  
9. Complete the titration within 20 seconds.  
10. Note down the final burette reading.

\* Phenolphthalein Indicator Solution - Dissolve two gram of phenolphthalein in 100 ml of ethnol. Add 0·1 N sodium hydroxide solution until one drop gives a faint pink colouration. Dilute with distilled water to 200 ml.  
  
**Calculation:**  
                                    No of ml. of 0.1 N NaOH solutions  
                                    required for neutralization                  x 0.009  
% Lactic acid =   ---------------------------------------------------------------------- x 100  
                                    Weight of sample  
                        (Weight of sample = Volume of milk x specific gravity)

