IAFMM FISH OIL BULLETIN
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RECOMMENDED METHOD OF ANALYSIS FOR DETERMINATION OF PEROXIDE VALUE OF FISH OILS

1. General

The method determines the peroxide value of the lipids in the sample. It is highly empirical and any variation in procedure may result in variation in results.

2. Principle

All substances which oxidize potassium iodide under the conditions of the test are determined. These are generally assumed to be peroxides (strictly hydroperoxides) or other similar products of fat oxidation. The liberated iodine is titrated with standard thiosulphate.

3. Apparatus

Mohr pipette; measuring type; 1 ml capacity.
Erlenmeyer flasks; glass stoppered; 250 ml.

4. Reagents

All reagents shall be of analytical reagent quality.

Butylated hydroxy toluene (BHT).

Acetic acid - chloroform solution (prepared by mixing 3 parts of volume of glacial acetic acid with 2 parts of volume of chloroform).

Potassium iodide solution, saturated. (Store in the dark. Test daily by adding 2 drops of starch solution to 0.5 ml of the potassium iodide solution in 30 ml of acetic acid - chloroform solution. If a blue colour is formed which requires more than 1 drop of 0.1N sodium thiosulphate solution to discharge, discard the iodide solution and prepare a fresh batch).

Sodium thiosulphate solution, approximately 0.1N, accurately standardized.

Sodium thiosulphate solution, approximately 0.01N, accurately standardized. (This solution may be prepared by accurately diluting the 0.1N solution 10 fold with recently boiled distilled water).

Starch indicator solution, 1 g of soluble starch in 100 ml distilled water.

5. Method

Accurately weigh 5 g of sample to the nearest 0.5 g and approximately 0.03g BHT into a 250 ml glass stoppered Erlenmeyer flask and add 30 ml of acetic-chloroform solution. Swirl the flask until the sample dissolves. Add 0.5 ml of saturated potassium iodide solution using the Mohr pipette.

Allow the solution to stand in the dark with occasional swirling for exactly 1 min and add 30 ml distilled water.

Titrate with 0.1N sodium thiosulphate adding it gradually and with constant and vigorous shaking until the yellow colour has almost disappeared. Add approximately 0.5 ml of starch indicator solution and continue the titration, shaking the flask vigorously near the end point to extract all the iodine from the chloroform layer. Add the thiosulphate dropwise until the blue colour just disappears. (Note: If the titration is less than 0.5 ml repeat the determination using 0.01N sodium thiosulphate solution).

Carry out a blank determination of the reagents daily. The blank titration must not exceed 0.1 ml of 0.1N sodium thiosulphate solution.

6. Calculation

Peroxide value, as milliequivalents of per 1000 g of sample

$$= \frac{(S-B)(N)(1000)}{\text{weight of sample (g)}}$$

Where : B = Titration of blank
S = Titration of sample
N = Normality of sodium thiosulphate solution.

7. Repeatability

The difference between two determinations carried out simultaneously or in rapid succession by the same analyst should not exceed 2.0 milliequivalents/kg.