PHOSPHATE METHOD 10

Using Phosphate LR Tablets

INTRODUCTION

Phosphates are extensively used in detergent formulations and washing powders. Agricultural fertilizers have a high Phosphate content. Phosphates are also used in the food processing industry and in industrial water treatment processes.

The presence of Phosphates in watercourses is thus due to a variety of reasons particularly from domestic and industrial effluents and run-off from agricultural land. Phosphates present in natural water pass through into drinking water supplies.

Whilst Phosphates are not generally considered harmful for human consumption, they do have a complex effect on the natural environment, contributing to rapid unwanted algal and plant growth in rivers and lakes.

The Lovibond Phosphate Low Range test provides a simple method for determining Phosphate levels over the range 0 to 4mg/l PO_4. The EEC guide level in drinking water is 0.4mg./l.as P_2O_5 (0.5mg./l. as PO_4) with a maximum admissible concentration of 5mg./l. P_2O_5 (6.7mg./l. PO_4).

PRINCIPLE OF METHOD

In the Phosphate Low Range method, Phosphates react under acid conditions with ammonium molybdate to form phospho-molybdic acid. This is then reduced by ascorbic acid to form the intensely coloured 'molybdenum blue complex'. A catalyst is incorporated to ensure rapid and complete colour development, and an inhibitor prevents interference from silica.

For maximum stability and convenience in practice, the reagents are combined together in the form of two tablets, using one of each per test. The intensity of the colour produced, which is proportional to the Phosphate concentration, is measured by comparison against Lovibond permanent coloured glass standards.

REAGENTS REQUIRED

1. **Lovibond Phosphate Low Range No. 1 Tablets**
2. **Lovibond Phosphate Low Range No. 2 Tablets**

THE STANDARD LOVIBOND COMPARATOR DISC 3/133

Disc 3/133 covers the range 0 to 4.0mg./l. Phosphate in steps of: 0, 0.25, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0 and 4.0mg./l. PO_4 and is used with 13.5mm./10ml. moulded cells.

METHOD

1. Fill a 13.5mm. moulded cell with sample to the 10ml. mark. Add one Phosphate Low Range No.1 tablet, crush and mix to dissolve.

2. Add one Phosphate Low Range No.2 tablet and again crush and mix to dissolve. Allow to stand for ten minutes, for full colour development, and then place the cell in the right-hand compartment of the Lovibond Comparator.

3. In the left-hand compartment place another cell containing sample only to compensate for any inherent colour in the sample. Hold the Comparator facing a standard source of white light, such as the Lovibond Daylight 2000 Unit or, failing this, North daylight (not fluorescent lighting) and rotate the disc until the nearest colour match is obtained. The disc reading is the concentration of phosphate in mg./l. as PO_4.

NOTES

1. If a colour is produced which is deeper than the top step on the disc, the test should be repeated with the sample diluted with deionised water. The resultant disc reading should then be multiplied by the dilution factor, e.g. a 2ml. sample diluted with 8ml. of deionised water: - disc reading x 5.

2. Phosphate concentrations can be expressed in a number of different ways. The following factors may be used for the conversions:

   To convert from PO_4 to P_2O_5:- Multiply by 0.75

   To convert from PO_4 to P: - Multiply by 0.33

REVISION HISTORY

Date	Change Note	Issue
18/06/02	36/460	2
06/04/05	CA243	3
24/10/06	JC106	4
20/01/09	JC140	5