

## IRON METHOD 6

### Using Iron Low Range (PPST) Tablets

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#### INTRODUCTION

Iron occurs widely in nature and is found in many natural and treated waters. Iron is an objectionable constituent in both domestic and industrial water supplies. The presence of Iron affects the taste of beverages and causes unsightly staining of laundered clothes, plumbing fittings and swimming pool surfaces. The formation of insoluble Iron deposits is troublesome in many industrial applications and in agricultural water uses such as drip feed irrigation. In industry Iron salts occur through corrosion of plant and equipment, and from industrial processes.

Testing for Iron is therefore important in the monitoring of natural and drinking water, for corrosion control in industry and for the checking of effluents and waste waters. The Iron Low Range test provides a simple method for the determination of low levels of soluble Iron in water over the range 0 to 1mg./l. Fe. The test responds to both Iron (II) & (III) and thus gives a measure of the total soluble Iron content of the water.

#### PRINCIPLE OF THE METHOD

The Iron Low Range test is based on a single tablet reagent containing 3-(2-Pyridyl)-5, 6-bis (4-phenylsulphonic acid)-1, 2-triazine (PPST) formulated with a decomplexing/reducing agent in an acid buffer. The test is carried out simply by adding a tablet to a sample of the water under test. The decomplexing/reducing agent breaks down weakly complexed forms of Iron and converts the Iron from the iron (III) to the iron (II) oxidation state. This, together with any iron (II) originally present as such in the sample, then reacts with PPST to form a pink colouration.

The intensity of the colour produced is proportional to the total Iron concentration and is measured by comparison against Lovibond permanent colour glass standards.

#### REAGENT REQUIRED

1. Lovibond Iron Low Range Tablets.

#### THE STANDARD LOVIBOND COMPARATOR DISCS 3/116, 3/144 and NESSLERISER DISC NOL

Disc 3/116 covers the range 0.1 to 1mg./l. of Iron (Fe) in steps of 0.1 omitting 0.9 and is used with 13.5mm./10ml. moulded cells.

Disc 3/144 covers the range 0.02 to 0.30mg./l. of Iron (Fe) in steps of 0.02, 0.04, 0.06, 0.08, 0.10, 0.15, 0.20, 0.25 and 0.30mg./l. and is used with 40mm. cells.

Disc NOL covers the range 0.01 to 0.1mg./l. of Iron (Fe) in steps of 0.01 omitting 0.09 and is used with 50ml. Nessler cylinders.

#### METHOD

##### COMPARATOR DISC 3/116

1. Fill a 13.5mm./10ml. moulded cell with sample to the 10ml. mark. Add one Iron Low Range tablet, crush and mix to dissolve. **Allow to stand for one minute** then place in the right-hand compartment of the Comparator (Note 1).
2. In the left-hand compartment, place another cell containing sample only to compensate for any inherent colour in the sample.

3. 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
4. The figure displayed in the bottom right-hand corner of the Comparator is the concentration of Iron in mg./l.

## COMPARATOR DISC 3/144

1. Follow the method for disc 3/116 above but use a 20ml. sample in a 40mm. cell and **two** Iron Low Range tablets.

## NESSLERISER DISC NOL

1. Fill a Nessler cylinder with sample to the 50ml. mark. Add **two** Iron Low Range tablets, crush and mix to dissolve. **Allow to stand for five minutes**, then place in the right-hand compartment of the Nessleriser (Note 1).
2. In the left-hand compartment place another Nessler cylinder containing sample only to compensate for any inherent colour in the sample.
3. Using the Lovibond Daylight 2000 unit, or failing this North daylight, rotate the disc until the nearest colour match is obtained. The disc reading gives the concentration of Iron in mg./l.

## NOTES

1. Colour development will normally be complete within the standing time stated. Continued colour development after this time is indicative of more strongly bound Iron complexes in the water. In such cases the test solution should be allowed to stand for a longer period, say 10 to 15 minutes, until colour development is complete.
2. In certain industrial applications strong complexing agents are added to act as corrosion inhibitors. Moreover some samples may contain precipitated Iron complexes or particles of metallic Iron. These samples will require pre-treatment if it is required to determine the total Iron content.

The standard method of pre-treatment is acidification, with or without boiling, depending on the nature of the sample.

To use the Iron Low Range test after such pre-treatment procedures add the Iron LR tablet to the acidified sample, neutralise by adding conc. Ammonia, 1 drop at a time, until a pink colour appears, then take the disc reading in the normal manner.

## REVISION HISTORY

Date	Change Note	Issue
15/05/02	36/460	2
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06/10/06	JC57	4