

Photometer Method

IRON MR

AUTOMATIC WAVELENGTH SELECTION

TEST FOR IRON IN NATURAL, TREATED AND INDUSTRIAL WATERS

0 – 5.0 mg/L

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, swimming pool surfaces and the like. The formation of insoluble iron deposits is troublesome in many industrial applications and in the agricultural water uses such as drip feed irrigation. In industry iron salts occur through corrosion of plant and equipment, and from industrial processes.

Iron is therefore an important test for the monitoring of natural and drinking waters, for corrosion control in industry and for the checking of effluents and waste waters. The Palintest Iron MR test provides a simple test for the determination of both ferrous and ferric iron. It is capable of dissolving colloidal and particulate iron and thus gives a measure of the total iron content of the water.

Method

In the Palintest Iron MR method iron is reduced to the ferrous form and then reacted with 1,10-phenanthroline to form an orange coloured complex. A decomplexing agent is incorporated into the reagent system in order to break down complexed forms of iron. The test is simply carried out by adding tablet reagents to a sample of the water under test.

The intensity of the colour produced is proportional to the iron concentration and is measured using a Palintest Photometer.

Interference can occur in industrial waters treated with molybdate and nitrite based treatment products. A supplementary reagent can be used to prevent this interference.

Reagents and Equipment

Palintest Iron MR No 1 Tablets

Palintest Iron MR No 2 Tablets

Palintest Citrate IR Tablets

Palintest Automatic Wavelength Selection Photometer

Round Test Tubes, 10 ml glass (PT 595)

Test Procedure

- 1 Fill the test tube with sample to the 10 ml mark.
- 2 Add one Iron MR No 1 tablet, crush and mix to dissolve.
- 3 Add one Iron MR No 2 tablet, crush and mix to dissolve.
- 4 Stand for 10 minutes to allow full colour development.
- 5 Select Phot 39 on Photometer.
- 6 Take Photometer reading in usual manner (see Photometer instructions).
- 7 The result is displayed as mg/L Fe.

Interferences

Hardness 500 mg/L CaCO₃, Silica 150 mg/L SiO₂ and Copper 3 mg/L Cu do not interfere with the test. Chromium 10 mg/L may cause slightly high results.

Nitrite greater than 50 mg/L NO₂ causes low results and molybdate at any concentration causes precipitation. The pretreatment procedures described below using Citrate IR tablets remove interference from nitrite up to 500 mg/L NO₂ and molybdate up to 20 mg/L MoO₄. This pretreatment does however reduce the tolerance to chromium and is not recommended therefore for chromium containing samples.

Pretreatment Procedure Using Citrate IR Tablets

Samples Containing Nitrite :-

- 1 Fill the test tube with sample to the 10 ml mark.
- 2 Add one Citrate IR tablet, crush and mix to dissolve. Ensure all particles are dissolved.
- 3 Continue the test as described in the test procedure from Stage 2 above but allow the tube to stand for 15 minutes to allow full colour development before taking the photometer reading.

Samples Containing Molybdate :-

- 1 Fill the test tube with sample to the 10 ml mark.
- 2 Add one Iron MR No 1 tablet, crush and mix to dissolve.
- 3 Add one Citrate IR tablet, crush and mix to dissolve. Ensure all particles are dissolved.
- 4 Continue the test as described in the test procedure from Stage 3 but allow the tube to stand for 15 minutes to allow full colour development before taking the reading.