

MOLYBDATE METHOD 1

Using Molybdate HR Tablets

INTRODUCTION

Formulations containing Molybdates are used as corrosion inhibitors in industrial water treatment. In particular they are used in closed recirculating systems such as hot water heating systems and also cooling water systems. Molybdate-based formulations have replaced older forms of corrosion inhibitors such as chromate.

It is necessary to control the Molybdate concentration within specified levels depending on the application involved. Since they are becoming widely used in water treatment and in industrial processes, the test for Molybdate is becoming increasingly important for effluents and industrial discharges.

The Molybdate test provides a simple means of measuring levels of Molybdate in water and effluents over the range 5 to 150mg./l. MoO₄.

PRINCIPLE OF THE METHOD

Molybdates react with thioglycollate under acid conditions to give a yellow coloured complex. An oxidising condition is maintained during the acidification stage to ensure that the Molybdate is in a fully oxidised state. Under the conditions of the test, iron does not interfere and there is not significant interference from other metals at levels likely to be found in industrial water systems.

For maximum convenience and stability, 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 Molybdate concentration, is measured by comparison against Lovibond permanent colour glass standards.

REAGENTS REQUIRED

1. Lovibond Molybdate No. 1 HR Tablets
2. Lovibond Molybdate No. 2 HR Tablets

THE STANDARD LOVIBOND COMPARATOR DISCS 3/137 and 3/138

Disc 3/137 covers the range 5 to 50mg./l. Molybdate in steps of: 5, 10, 15, 20, 25, 30, 35, 40 and 50mg./l. MoO₄ and is used with 40mm. cells.

Disc 3/138 covers the range 10 to 150mg./l. Molybdate in steps of: 10, 20, 30, 40, 60, 80, 100, 120 and 150mg./l. MoO₄ and is used with 13.5mm./10ml. moulded cells DB424.

METHOD

Disc 3/137

1. Fill a 40mm. cell to the 20ml. mark with sample. Add one Molybdate No. 1 HR tablet, crush and mix to dissolve.
2. Add one Molybdate No. 2 HR tablet, crush and mix to dissolve completely. 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 or turbidity. Hold the Comparator facing a standard source of white light, such as the Lovibond White Light Cabinet, or failing this, North Daylight (not fluorescent), and rotate the disc until the nearest colour match is

obtained. The disc reading represents the Molybdate concentration present in the sample in milligrams per litre as MoO₄.

Disc 3/138

As above for disc 3/137, except that a 10ml. sample and 13.mm./10ml. moulded cells are used.

NOTE

The following factors may be used to convert readings:

From MoO₄ to Na₂MoO₄ multiply by 1.3

From MoO₄ to Mo multiply by 0.6

REVISION HISTORY

Date	Change Note	Issue
11/12/02	36/460	2
22/03/05	CA243	3
11/10/06	JC75	4