

SILICA METHOD 3

Using Silica Tablets

INTRODUCTION

Silicon, in the form of Silica, is one of the earth's most abundant elements. Silicon is found widely in natural waters as colloidal Silica or soluble Silicates. Silica and Silicates do not normally cause any problems in water intended for domestic consumption. However, their presence is undesirable in water used in a variety of industrial applications. This is because of the tendency of such water to form a hard scale on equipment. Silica and Silicate-containing waters are particularly troublesome in steam generating plants, such as high-pressure boilers, since Silica scale can build up on turbine blades.

The following procedure provides a simple means of measuring Silica and Silicate levels in natural, treated and industrial waters.

PRINCIPLE OF THE METHOD

Ammonium Molybdate reacts with Silica under acid conditions to produce molybdosilicic acid. In the presence of a reducing agent, this compound is reduced to form an intense blue complex. Phosphate reacts in a similar manner and introducing a reagent that destroys any molybdophosphoric acid (which may form) prevents interference.

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

REAGENTS REQUIRED

1. **Lovibond Silica No. 1 Tablets**
2. **Lovibond Silica No. 2 Tablets**
3. **Lovibond Silica PR Tablets (to remove phosphate interference)**

THE STANDARD LOVIBOND COMPARATOR DISC 3/139 and 3/147

Disc 3/139 covers the range 0.4 to 4.0mg./l. Silica as SiO₂ in steps of 0.4, 0.6, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5 and 4.0mg./l.

Disc 3/147 covers the range 1 to 10mg./l. Silica as SiO₂ in steps of 1, omitting 9.

Both discs are used with 13.5mm./10ml. moulded cells.

METHOD

1. Fill a 10ml. moulded cell to the 10ml. mark with sample; add one Silica No. 1 tablet, crush and mix to dissolve. Stand for 5 minutes to allow the Silica to react.
2. Add one Silica PR tablet, crush and mix to dissolve (if phosphate is known to be absent, this stage may be omitted).
3. Add one Silica No. 2 tablet, crush and mix to dissolve. Stand for one minute to allow full colour development.
4. Place the cell in the right-hand compartment of the Comparator and another cell filled with sample only in the left-hand compartment. Match the colour produced in the test against the disc by holding the Comparator

against a standard source of white light, such as the Lovibond Daylight 2000 Unit, or failing this, North daylight (not fluorescent lighting). Rotate the disc until the nearest colour match is obtained.

5. The figure displayed in the bottom right-hand corner of the Comparator is the concentration of Silica (SiO₂) in mg. /l.

REVISION HISTORY

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