

OXYGEN METHOD 2

PRINCIPLE OF THE METHOD

The water sample in a completely filled bottle is treated with a manganese chloride solution and then a solution containing potassium hydroxide, potassium iodide and sodium azide. Manganese hydroxide is precipitated and reacts with the dissolved oxygen to form higher oxides of manganese. On acidification these oxidise the iodide to iodine. The amount of iodine produced under the conditions of the test is directly proportional to the concentration of dissolved oxygen present in the sample and is measured by comparison with a series of Lovibond permanent colour glass standards.

Sodium azide is added to prevent interference from nitrite.

REAGENTS REQUIRED

1. **Lovibond Dissolved Oxygen Reagent 1 (pink aqueous solution)**
2. **Lovibond Dissolved Oxygen Reagent 2 (colourless aqueous solution)**
3. **Lovibond Dissolved Oxygen Reagent 3 (white crystals)**
4. **Lovibond Potassium Iodide Tablets.**

THE STANDARD LOVIBOND COMPARATOR DISCS 3/3 AND 3/165 AND NESSLERISER DISCS NKA AND NKB

Comparator disc 3/3 covers the range 4 to 12mg./l. in steps of 1mg./l. and is used with 13.5mm./10ml. moulded cells.

Comparator disc 3/165 covers the range 2 to 12mg./l. in steps of 1mg./l. omitting 9 and 11mg. /l. and is used with 13.5mm./10ml. moulded cells

Nessleriser Disc NKA is intended for the determination of dissolved oxygen in boiler feed water, covering the range 0.05 to 1.0ml. of dissolved oxygen per litre in steps of 0.1 from 0.1 upwards. This is equivalent to 0.07 to 1.4mg./l.

Nessleriser Disc NKB is intended for the determination of dissolved oxygen in river and other natural water covering the range 0.4 to 1.6mg./l. which can be extended to 16mg./l following the dilution technique given in the notes.

METHOD

Comparator

1. Immerse the sample collection bottle in the water to be tested. Make sure the bottle is completely filled.
2. Carefully insert the stopper and then remove it. This leaves the water at the correct level in the bottle.
3. Add 5 drops of Dissolved Oxygen Reagent 1.
4. Add 5 drops of Dissolved Oxygen Reagent 2.
5. Stopper the bottle carefully and invert rapidly several times, making sure the stopper is held in place, to ensure thorough mixing of the contents.

6. Allow to stand for 5 minutes. A brownish flocculant precipitate should settle out.
7. Remove the stopper and quickly add one spoonful of Reagent 3. Carefully replace the stopper and shake the bottle thoroughly until a clear yellow coloured solution is given.
8. Fit disc 3/3 or 3/165 into the Lovibond Comparator and place a 13.5mm./10ml. moulded cell containing untreated water sample in the left-hand compartment.
9. Pour about 10ml of the treated sample into a 13.5mm./10ml moulded cell and place this in the right-hand compartment of the Comparator. Hold the Comparator against 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.
10. The figure displayed in the bottom right-hand corner of the Comparator is the concentration of dissolved oxygen in mg./l.

Nessleriser

1. Carry out steps 1 to 7 as for the Comparator method.
2. Fill a Nessler tube to the 50ml. mark with the treated solution. Put this in the right-hand compartment of the Nessleriser.
3. Fill a second Nessler tube to the 50ml. mark with untreated sample. Place this tube in the left-hand compartment of the Nessleriser (see Note 2). Insert the relevant disc.
4. Using the built-in light source or North daylight (not fluorescent lighting) match the colour produced, rotating the disc until the nearest colour match is obtained.

Disc NKA: - The figure displayed in the Nessleriser is the concentration of dissolved oxygen in ml./l. To convert to mg./l. multiply by 1.4.

Disc NKB: - reads directly as mg./l. of dissolved oxygen.

NOTES

1. Should the colour of the treated water be deeper than that of the top step of the disc, measure a smaller sample volume of the treated sample into a clean 10ml. moulded cell (Comparator method) or Nessler tube (Nessleriser method). Fill to the mark with untreated sample and add one potassium iodide tablet, followed by one spoonful of Reagent 3. Crush and mix to dissolve. Match the colour produced against the disc and multiply the reading by the dilution factor to obtain the true reading.
2. Many natural waters contain iron, which in the iron (III) state will oxidise potassium iodide to iodine. To allow for any yellow colour due to iodine from this source, add one potassium iodide tablet and one spoonful of Reagent 3 to the untreated water under test, crush and mix to dissolve. Use this in the left-hand compartment instead of untreated blank.

REVISION HISTORY

| Date | Change Note | Issue |
|----------|-------------|-------|
| 17/06/02 | 36/460 | 2 |
| 30/03/05 | CA243 | 3 |
| 19/10/06 | JC92 | 4 |