

EXPERIMENT 4

Date:

OBJECTIVE:

Estimation of Biochemical Oxygen Demand (BOD) of waste water

CHEMICAL REQUIRED:

1. Phosphate buffer- Dissolve 8.5g of KH_2PO_4 , 21.75g of K_2HPO_4 , 33.4g of $\text{Na}_2\text{HPO}_4 \cdot 7\text{H}_2\text{O}$ in 500 ml of distilled water and dilute it to one litre.
2. Magnesium sulphate solution- Dissolve 22.5g of $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ in sufficient distilled water and dilute to one litre.
3. Calcium chloride solution – Dissolve 27.5g of anhydrous calcium chloride in sufficient distilled water and dilute to one litre.
4. Ferric chloride solution- Dissolve 0.25 g $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ in distilled water and dilute to one litre.

APPARATUS REQUIRED:

Narrow mouthed flat stoppable bottles, BOD incubator, 1ml pipette and conical flask

PROCEDURE:

1. Prepare dilution water by adding 1.0 ml of each of phosphate buffer solution, magnesium sulphate solution, calcium chloride solution and ferric chloride solution to one litre of distilled water. Add 2.0ml of sewage and aerate. Determine the exact capacity of three 125ml narrow mouthed flat stoppable bottles.
2. Find out the DO level of undiluted sample.
3. Prepare the desired mixture by adding sample in dilution water.
4. Fill up one bottle with the mixture and the other one with the dilution water (Blank).
5. Incubate at a fixed temperature for a definite time (20°C - 5days or 35°C - 3 days).
6. Find out the DO in both bottles after incubation.

CALCULATIONS

$$\text{BOD in mg/l} = \frac{(\text{Dob} - \text{Doi}) \text{ Vol of bottle} - (\text{Dob} - \text{Dos})}{\text{Vol. of Sample}}$$

Where,

Dob- DO of blank (Dilution water) after incubation

Doi- DO of mixture after Incubation

Dos- DO of undiluted sample

Experiment 04

Date:

Sample No	Point of Collection	Observed Levels	Date of Collection	Time of Collection	Recommendations

Rough work

EXPERIEMNT 5

Date:

OBJECTIVE:

Estimation of chemical Oxygen Demand (COD) of waste water.

CHEMICAL REQUIRED:

1. 0.05 N Potassium dichromate- Dissolve 2.452g dried, crystalline $K_2Cr_2O_7$ in distilled water and make up the volume to 1 litre.
2. 0.05N Ferrous ammonium sulphate (FAS)- Dissolve 19.61g of $Fe(NH_4)_2(SO_4)_2 \cdot 6H_2O$ In 800 ml of distilled water containing 1ml of conc. Sulphuric acid. And make up the volume to 1 litre.
3. Mercuric sulphate.
4. Ferroin indicator-Dissolve 1.888g of 1:10 phenanthrolin monohydrate and 0.70g of $FeSO_4 \cdot 7H_2O$ in 100ml of distilled water.

APPARATUS REQUIRED:

$KMnO_4$ Solution, Potassium iodide, Formalin

PROCEDURE:

1. Pipette out 20ml of water sample into a 125ml Erlenmeyer flask. Add exactly 10ml of 0.05 N $K_2Cr_2O_7$ solutions to the flask.
2. Add 200mg $HgSO_4$ for each 1000mg per litre of chloride ($HgSO_4 : Cl : : 10 : 1$). Swirl until the $HgSO_4$ is dissolved.
3. Add carefully 30 ml of conc. H_2SO_4 cover the flask with watch glass and allow to stand for 30 min.
4. Add 15ml of distilled water and 3 drops of ferroin indicator and titrate the whole reaction mixture with FAS of same normality.
5. Prepare blank with 20 ml distilled water and repeat the same procedure.

CALCULATIONS:

$$COD \text{ mg/l} = \frac{(B-S) \times N \times 8000}{V} \quad S = \text{Titrate value for sample in ml}$$

Where,

B= Titre value for Blank in ml.

N= Normality of FAS

V= Volume of sample in ml

Experiment 5

Date:

Sample No	Point of Collection	Observed Levels	Date of Collection	Time of Collection	Recommendations

Rough work

