EXPERIMENT NO : 3 **DATE:**

Determination of COD of the given Industrial Waste water sample

PRINCIPLE: COD is a measure of oxygen equivalent of that portion of oxidisable materials that can be oxidized by a strong oxidizing agent. Chemical oxygen demand is an important parameter in industrial waste water treatment. Straight chain aliphatic compounds, aromatic hydrocarbons, straight chain aliphatic compounds, aromatic compounds, straight chain alcohols acids, pyridine and other oxidisable materials are present as impurities in waste water. Straight chain compounds, acetic acid etc., are oxidized more effectively when mercuric sulphate is added as catalyst**.**

PROCEDURE:

Part-A: Preparation of standard ferrous ammonium sulphate (FAS) solution.

Weigh accurately the given FAS and transfer into a 250cm^3 standard flask using funnel. Add 1tt of dilute sulphuric acid followed by about 100cm^3 of water. Dissolve the, make it up to the mark and shake well for uniform concentration.

Part-B: Blank titration:

Pipette out 10cm^3 of potassium dichromate solution into a conical flask using a pipette. Add 1 ½ tt of dilute sulphuric acid containing mercuric sulphate catalyst and 3 drops of ferroin indicator. Titrate against FAS taken in the burette until the colour changes from bluish green to reddish brown. Note the burette reading and repeat the titration to get concordant values.

Part-C: Back titration:

Pipette out 25cm^3 of given sample of waste water in to a conical flask. Add 10cm^3 of standard potassium dichromate solution using a pipette. Add ½ tt of dilute sulphuric acid containing mercuric sulphate catalyst, while shaking the flask constantly. Add 3-4 drops of ferroin indicator and titrate it against FAS solution taken in the curette till the colour changes from bluish green to reddish brown. Note down the burette reading and repeat the titration to get concordant values.

Experiment no:

Observation and Calculations

Part A: Preparation of standard FAS solution

Weight of weighing bottle and FAS salt: g
Weight of empty weighing bottle: g
Weight of FAS salt: g

$$\text{Normality of FAS: } \frac{\text{Weight of FAS salt X 4}}{\text{Equivalent weight of FAS}} = \frac{\text{W X 4}}{392.24} \quad \text{(X)}$$

Determination chemical oxygen demand of water sample

Part B: Blank titration

Burette : Standard FAS solution
Conical flask :25 cm^3 of potassium dichromate solution + 1 test tube of dil H_2SO_4 (1:1)
Indicator : 4 drops of ferroin indicator
End point : Bluish green to reddish brown

Blank titration reading: (V_1) cm^3

Part C: Back titration

Burette : Standard FAS solution
Conical flask :25cm3 of waste water sample+25 cm^3 of potassium dichromate solution + 1 test tube of dil H_2SO_4
Indicator :4 drops of ferroin indicator
End point : Bluish green to reddish brown

Trials Burette readings	I	II	III
Final reading			
Initial reading			
Volume of FAS run down in cm^3(V_2)			

1000cm^3 of 1N FAS solution =1 equivalent of oxygen = 8g of oxygen

Therefore ($V_1 - V_2$) cm^3 of X N FAS = $\frac{X x (V_1 - V_2) x 8}{1000}$ (a g)

25cm^3 of waste water sample contains ---------- (a) g of oxygen

Therefore 1000cm^3 of waste water sample requires a $\frac{x\ 1000}{25}$---------- (B) g of oxygen

RESULT: COD of waste water sample: ……..(B)mg dm^{-3}