SAP - ID - 60004200132
Name - Ayush Jain

18/03/2021

# Engineering Chemistry

## Tutorial - 2 - Water

1) A 50 ml of water sample contains 500 ppm of dissolved oxygen. The water sample is diluted to 100 ml. After 5 days of incubation the DO value of water sample reduces to 400 ppm. Calculate BOD of water sample.

Ans Given:

Water sample before dilution = 50 ml.

Water sample after dilution = 100 ml.

$\therefore DO_b = 500 \text{ ppm}$

$DO_i = 400 \text{ ppm}$

$\therefore BOD = [DO_B - DO_i] \times \text{Dilution factor.}$

$= [DO_B - DO_i] \times \frac{\text{ml. of sample after dilution}}{\text{ml. of sample before dilution}}$

$= [500 - 400] \times \frac{100}{50}$

$= 100 \times \frac{100}{50}$

$= 200 \text{ ppm}$

$\therefore$ BOD of water sample is 200 ppm.

2) 10 ml of waste water was refluxed with 20 ml of $K_2Cr_2O_7$ and after refluxing the excess unreacted dichromate required 26.2 ml of 0.1N FAS solution. A blank of 10 ml of distilled water on refluxing with 20 ml of $K_2Cr_2O_7$ solution required 36 ml of 0.1N FAS solution. Calculate the COD of waste water sample.

Solution: Given:

$V_B = 36$ ml

$V_t = 26.2$ ml

$N = 0.1$ normal

$V_e = 10$ ml

$$\therefore COD = \frac{(V_B - V_t) \times N \times 8000}{V_e}$$

$$= \frac{(36 - 26.2) \times 0.1 \times 8000}{10}$$

$= 784$ ppm

$\therefore$ COD of waste water sample is 784 ppm.

3) 20 ml of waste water was refluxed with 30 ml of $K_2Cr_2O_7$ and after refluxing the excess unreacted dichromate required 11 ml of 0·1N FAS solution. A blank of 20 ml of distilled water on refluxing with 30 ml of $K_2Cr_2O_7$ solution required 14 ml of 0·1N FAS solution. Calculate the COD of waste water sample.

Solution. Given:

$V_b$ = ~~30 ml~~ = 14 ml

$V_t$ = 11 ml

N = 0·1 Normal

$V_e$ = 20 ml

$$\therefore COD = \frac{(V_B - V_t) \times N \times 8000}{V_e}$$

$$= \frac{(14 - 11) \times 0.1 \times 8000}{20}$$

$$= 120 \text{ ppm}$$

∴ COD of waste water sample is 120 ppm.