WALWA TALUKA EDUCATION SOCIETY'S

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# "CERTIFICATE COURSE IN HOUSEHOLD CHEMICAL"

DEPARTMENT OF CHEMISTRY

B.Sc-III

# INDEX

# SANITARY ACID

**Acid -**

Acids are defined as sinstances which have sour taste, ability to change litmus paper blue to red and high solvent power.

**Bases -**

Bases are defined as substances which turn red litmus blue, slippery in nature, soapy to touch and neutralized acids to form salts.

**Types of Acids -**

Acids are two types

1) Strong acid –
   In this type complete dissociation is takes place.
   e.g. HCl, $HNO_3$, $H_2SO_4$.

2) Weak acid –

   It does not shows complete dissociation.

   e.g. Acetic acid.

**Types of Titrations –**

| | Types of Titrations | Indicator Uses |
|---|---|---|
| 1) | S.A – S.B | Phenolphthalein |
| 2) | S.A – W.B | Phenolphthalein, methyl orange |
| 3) | W.A – W.B | Methyl orange |
| 4) | W.A – S.B | Methyl orange |

To calculate normalities of sample of sanitary acids available in market.

**1) <u>Preparation of standard solution of Oxalic acid</u> –**

i) Weight accurately $1.575 \times 10^{-3}$ kg Crystalline Oxalic acid on clean and dry weighted watch glass.

ii) Transfer the crystalline in 250 $cm^3$ distilled water wash the watch glass with distilled water and collect the washings in beaker. Stir well.

iii) Transfer the clear solution to 250 $cm^3$ volumetric flask and dilute this solution upto the mark with distilled water. Shake it well. This is standard solution of Oxalic acid. Use this solution for standardization of acetic acid.

Calculation of equivalent weight of Oxalic acid and weight of Oxalic acid required preparing 250 $cm^3$ of 0.1N solution.

**Equivalent Weight –**

$$\text{Eq. Wt} = \frac{\text{Molecular Weight of Oxalic acid}}{\text{Basicity of Oxalic acid}}$$

$$= \frac{126}{2}$$

$$= 63 \text{ g.}$$

**Weight of Oxalic acid –**

1N 1000 $cm^3$ Oxalic acid solution = 63 g. crystalline Oxalic acid

0.1N 1000 $cm^3$ Oxalic acid = 6.3 g. crystalline Oxalic acid

0.1N 250 $cm^3$ Oxalic acid $= \frac{6.3}{4} = 1.575$ g. crystalline Oxalic acid

$= 1.575 \times 10^{-3}$ kg crystalline Oxalic acid

**2) <u>Standardisation of given NaOH solution</u> –**

1) Take 25 $cm^3$ 1N (approximately) NaOH solution in 250 $cm^3$ volumetric flask and dilute it with distilled water upto the mark. Shake it well.
2) Fill the burette with standard solution of Oxalic acid.
3) Titrate 25 $cm^3$ of this diluted NaOH solution against standard solution of oxalic acid (0.1N) using phenolphthalein as an indicator.
4) End point of the titration os pink to colorless.

**Calculations –**

Exact normality of NaOH

$H_2C_2O_4$ Vs NaOH

$N_1V_1 = N_2V_2$

$0.1 \times Y = N_2 \times 25$

$$N_2 = \frac{0.1 \times 25.2}{25}$$

$N_2 = 0.1008$ N

Therefore Noramlity of NaOH ($N_2$ ) is 0.1008 N.

**3) <u>Determination of normalities of Sample of Sanitary acid</u> –**

1) Tip – Top Sanitary acid

**Calculation –**

$N_1V_1 = N_2V_2$

$5.0 \times 10 = N_2 \times 7.3$

$$N_2 = \frac{5 \times 10}{7.3}$$

$N_2 = 6.84$ N.

Normality of Tip – Top Sanitary acid is 6.84 N.

1 lit. = Prize = 25 Rs.

2) White – Cat Sanitary acid –

**Calculation -**

$N_1V_1 = N_2V_2$

$5.0 \times 10 = N_2 \times 5$

$$N_2 = \frac{50}{25}$$

$N_2 = 10$ N.

Normality of White cat Sanitary acid is 10 N.

1 lit. = Prize = 25 Rs.

3) Normality of Sanitary acid in college laboratory –

**Calculation -**

$N_1V_1 = N_2V_2$

$5.0 \times 10 = N_2 \times 5$

$$N_2 = \frac{5 \times 10}{16.5}$$

$N_2$ = 3.03 N.

Normality of College laboratory is 3.03 N.

4) Preparation of Sanitary acid in college laboratory –

**Procedure –**

For the preparation of sanitary acid follows the procedure given below

i) First wash the apparatus with distilled water.

ii) Take 1 lit. of concentrated HCl solution in galss jar.
iii) Dilute the concentrated HCl up to 2 – 3 lit. using distilled water.
iv) Resulting solution is called as sanitary acid.

5) Normality of strength of Sanitary acid prepared in laboratory –

**Calculation -**

$N_1V_1 = N_2V_2$

$5.0 \times 10 = N_2 \times 16.5$

$$N_2 = \frac{5 \times 10}{16.5}$$

$N_2$ = 3.03 N.

Normality of sanitary acid prepared in laboratory is 3.03 N.

6) Comparison of acids strength in sanitary acid –
By comparing these three sanitary acids, White - Cat Sanitary acid is good quality because it has normality 10 N.
As compared to White - Cat Sanitary acid, Tip – Top Sanitary acid is not much better because it has normality 6.84 N. As compare to both Sanitary acids the noramality of Sanitary acids prepare in laboratory is 3.03 N is not much better than this two.

7) The prepared Sanitary acid packed in plastic cans and bottles etc. Cans and bottles may be coloured or colorless.

8) Calculate the price of Sanitary acid.

9) Concentrated acid price is 4 Rs per litre, packing plastic bottle is 3 Rs and labelling cost is 50 paise. Therefore the manufacturing price of Sanitary acid for 1 litre is approx. 7.50 Rs.

**Uses of Sanitary acid –**

i) Sanitary acid is mainly used for cleaning purpose.

ii) Sanitary acid decreases the surface tension between oily part or dirty part and the tiles and shows cleaning acid.

i) Only part is soluble in acid, thus it is easily removable and clean the tile.

# PHENYL

**(**Phenyl is a viscous liquid used for washing tiles and and toilets i.e. mainly used for domestic purposes) There are mainly two types of phenyl –

1. Black Phenyl
2. White Phenyl

## White Phenyl

**Aim** **:** To prepare white phenyl.

**Apparatus** **:** Glass jar (5 lit.), stirrer, plastic jar.

**Chemicals** **:** Turkey red oil (TRO), pine oil, distilled water, scent.

**Procedure** **:**

For the preparation of White Phenyl follow the procedure given below –

i) First wash the apparatus with distilled water.
ii) Take 1 kg of TRO in glass jar. Add to it 1 lit. pine oil. Stir well the mixture by stirrer till it becomes homogeneous.
iii) After stirring the color of mixture it becomes white.
iv) Scent is added according to user choice, quantity is 30 ml for 1 lit. TRO stir well. Resulting solution is called as **Concentrated White Phenyl**.
v) Dilute the concentrated white phenyl up to 5 – 10 lit. using distilled water.

The cost of chemicals used in the preparation of white phenyl are given below.

| Sr. No. | Chemicals | Quality | Price |
|---|---|---|---|
| 1 | TRO | 2 kg | 45/- |
| 2 | Pine Oil | 1 lit. | 55/- |
| 3 | Scent (Citronella) | 30 ml | 20/- |

**Storage –**

For the storage of White Phenyl, plastic cans can be used. Manufacturing price approx. 8.30 per/fit. for good quality Phenyl.

TRO – Turkey Red Oil (Emulsifying agent) Caster oil + $H_2C_2O_4$, NaOH

TRO – Is used for dissolve pine oil.

TRO – Is also used as anti-foaming agent in industries.

## Black Phenyl

**(**Black Phenyl always sufficient more than White Phenyl.)

**Aim** **:** To prepare black phenyl.

**Apparatus** **:** Glass jar (3 lit.), stirrer, plastic jar, beaker (500 $cm^3$), glass Rod

**Chemicals** **:** Turky Red Oil (TRO), Cryosril Oil.

**Procedure** **:**

For the preparation of Black Phenyl follow the procedure given below –

i) First wash the apparatus with distilled water.
ii) Take 1 kg of TRO in glass jar. Add to it 1 lit. Cryosril oil. Stir well the mixture by the help of stirrer.

iii) Resulting solution is called as **Concentrated Black Phenyl**.

iv) Dilute 1 lit. concentrated white phenyl up to 5 lit. using distilled water.

The cost of chemicals used in the preparation of white phenyl are given below –

| Sr. No. | Chemicals | Quantity | Price |
|---|---|---|---|
| 1 | TRO | 1 kg | 45/- |
| 2 | Cryosril Oil | 1 lit. | 56/- |

**Storage –**

For the storage of Black Phenyl, plastic cans can be used. Black Phenyl has better cleaning action then that of White Phenyl.

**Uses –** It is used for washing tiles and toilets.