LAB.EXP (1)

DETERMINATION OF NORMALITY OF SODIUM HYDROXIDE (NaOH) BY USING STANARD SOLUTION OF HYDROCHLORIC ACID (HCl)

PERFORMANCE OBJECTIVE

Upon completion of this laboratory experiment, the student technician will be able to calculate the normality of base (soduim hydroxide).

EQUIPMENT

1. Burette (50 ml)
2. Burette stand and clamp
3. Pipette (10 ml)
4. Beaker (50 ml)
5. Conical flask (100 ml)

MATERIALS

1. Base with unknown normality (NaOH)
2. Acid with known normality (HCl)
3. Indicator methyl orange (M.O.) or phenolphthalein (ph.ph.)

PROCEDURE

1. Put acid with known N (HCl) in the burette.
2. Measure 10 ml of base with unknown normality (NaOH) by pipette in the flask.
3. Add about 3 drops of indicator (ph.ph. or M.O.)and observe the color of solution.
4. Record the level of acid at burette in Table 1 (first reading).
5. Start adding acid from burette drop by drop and observe the end point by changing the color of indicator.
6. Record the second reading of burette in Table 1.
7. Measure the volume of acid which neutralized 10 ml of base.
8. Repeat steps 1 to 6 two times and record your result in Table 1
9. Calculate the mean volume of acid.
10. Calculate the normality of unknown base from equation

$$(N \times V)_{HCl} = (N \times V)_{NaOH}$$

N_{HCl} is the normality of acid

N_{NaOH} is the normality of base

V_{HCl} is the volume of acid

V_{NaOH} is the volume of base

INDICATORS	Volumeof base (v_b)	Normality of acid (N_a)	Volume of acid (V_a)			Mean volume of acid (V_{av})	Normality of base $N_b = \frac{N_a \times V_a}{V_b}$
			1^{st} reading V_1	2^{nd} reading V_2	**V**		
phenolphthalein							
methyl orange							

LAB.EXP (2)

DETERMINATION OF NORMALITY OF SODIUM CARBONATE (Na_2CO_3) BY USING STANARD SOLUTION OF HYDROCHLORIC ACID (HCl)

PERFORMANCE OBJECTIVE

Upon completion of this laboratory experiment, the student technician will be able to calculate the normality of base (sodium carbonate).

EQUIPMENT

1. Burette (50 ml)
2. Burette stand and clamp
3. Pipette (10 ml)
4. Beaker (50 ml)
5. Conical flask (100 ml)

MATERIALS

1. Base with unknown normality (Na_2CO_3)
2. Acid with known normality (HCl)
3. Indicator methyl orange (M.O.) or phenolphthalein (ph.ph.)

PROCEDURE

1. Put acid with known N (HCl) in the burette.
2. Measure 10 ml of base with unknown normality (Na_2CO_3) by pipette in the flask.
3. Add about 3 drops of indicator (ph.ph. or M.O.)and observe the color of solution.
4. Record the level of acid at burette in Table 1 (first reading).
5. Start adding acid from burette drop by drop and observe the end point by changing the color of indicator.
6. Record the second reading of burette in Table 1.
7. Measure the volume of acid which neutralized 10 ml of base.
8. Repeat steps 1 to 6 two times and record your result in Table 1
9. Calculate the mean volume of acid.
10. Calculate the normality of unknown base from equation

$(N \times V)_{HCl} = (N \times V)_{Na_2CO_3}$

N_{HCl} is the normality of acid

N_{Na2CO3} is the normality of base

V_{HCl} is the volume of acid

V_{Na2CO3} is the volume of base

INDICATORS	Volumeof base (v_b)	Normality of acid (N_a)	Volume of acid (V_a)			Mean volume of acid (V_{av})	Normality of base N_b = $\frac{N_a \times V_a}{V_b}$
			1st reading V_1	2nd reading V_2	**V**		
phenolphthalein							
methyl orange							

LAB.EXP (3)

ACID BASE TITRATION USING THE pH METER AND pH paper

PERFORMANCE OBJECTIVE

Upon completion of this laboratory experiment, the student technician will be able to titrate an acid and base using a pH meter and paper.

EQUIPMENT

1. Burette (50 ml)
2. Pipette (5 ml)
3. pH meter
4. pH paper

MATERIALS

1. Base with unknown normality (Na_2CO_3)
2. Acid with known normality (HCl)
3. Universal indicator chart.

DISCUSSION

pH paper

Paper strips that have been treated with a mixture of indicators which used to estimate the pH of a solution. The indicators are chosen so that each one will change color at a different pH. The pH estimated by moistening the paper with being tested, then matching its color with a color on a chart provided by the manufacture of the paper.

pH meter

A pH meter and its electrode form a sensitive electrochemical device that makes possible the accurate measurement of the pH of a solution. Any pH meter is just a voltammeter that measures the voltage of an electric current flowing through a solution between two electrodes, one of them is called a **glass electrode** and this is sensitive to the concentration of H_3O^+ ions in the solution, the other electrode is called the **Reference electrode** which its operation is independent of the composition of the solution. There is a direct relationship between the voltage and the pH of the solution;

as a result the meter on the instrument is calibrated directly in pH units rather than volts.

PROCEDURE

1. Take 5 ml of NaOH solution of unknown concentration in a clean beaker of 50 ml.
2. Immerse the pH paper into a solution for few seconds.
3. Match the color of pH paper with the universal indicator chart and note the pH.
4. Add 0.5 ml of HCl solution in the beaker by pipette or burette and shake the reaction mixture.
5. Again immerse the pH paper in to the reaction mixture and note the pH on each addition of 0.5 ml of HCl record the pH in table 1.
6. Plot the graph between the added volume of HCl and pH.
7. Conduct a similar experiment as above but use a pH meter for pH determination instead of pH paper.
8. Find the volume of HCl used at pH =7 (equivalence point) from the graph.
9. Calculate the normality of the unknown base using the equation

$$\mathbf{N_a \times V_a = N_b \times V_b}$$

$\mathbf{N_a}$ is the normality of acid

$\mathbf{N_b}$ is the normality of base

$\mathbf{V_a}$ is the volume of acid from graph

$\mathbf{V_b}$ is the volume of base

Test No.	Volume of base (ml) unknown conc.	Volume (ml) of 0.1M HCl	pH by pH paper	pH by pH meter
1	5 ml	0.00		
2		0.5		
3		1.0		
4		1.5		
5		2.0		
6		2.5		
7		3.0		
8		3.5		
9		4.0		
10		4.5		
11		5.0		
12		5.5		
13		6.0		
14		6.5		
15		7.0		
16		7.5		
17		8.0		
18		8.5		
19		9.0		
20		9.5		
21		10.0		

LAB.EXP (4)

DETERMINATION OF THE CHANGE OF ENTHALPY OF NEUTRALIZATION OF HYDROCHLORIC ACID (HCl) WITH SODIUM HYDROXIDE(NaOH)

PERFORMANCE OBJECTIVE

Upon completion of this laboratory experiment, the student technician will be able to measure the enthalpy change accompanying neutralization reactions using a calorimeter.

EQUIPMENT

1. Bunsen burner
2. Graduated cylinder (50 ml)
3. Beaker (250 ml) &(100 ml)
4. Thermometer (25ml)

MATERIALS

1. Sodium hydroxide solution (1.00M)
2. Hydrochloric acid solution (1.00M)

PROCEDURE

1. Place exactly 25 ml of 1m HCl in the calorimeter. Allow 5 to 10 minutes for the system to reach the final thermal equilibrium, and then record the temperature.
2. Place exactly 25 ml of 1M NaOH in another beaker, measure the temperature.
3. The temperatures of HCl and NaOH should not differ by more than 0.5°C.
4. Holding thermometer in the calorimeter, add NaOH into the calorimeter. Stir the thermometer gently and record the highest temperature observed.

Tabulate your data as follows:

1. Temperature of HCl solution **(T_a) =----------**°C.
2. Temperature of NaOH solution **(T_b) =----------**°C.

3. Average temperature of above solution, if different **$T = T_a + T_b / 2$ =----------**°C.

4. Highest temperature observed after mixing acid with base **T_m =----------**°C.

5. Change in temperature **ΔT= T_m – T = ----------**°C.

6. Weight of empty conical **W_1 =----------gm**

7. Weight of solution **w_{soln}=----------gm**

CALCULATION

1. Heat gained by solution **=ΔT x S x m =----------Cal**
2. Heat gained by calorimeter **=ΔT x S x m =----------Cal**
3. Heat gained by solution and calorimeter **=----------Cal**
4. Moles of water produced by the reaction **= molarity x volume (L)**
   =----------mole
5. ΔH = heat of neutralization **=**

q / no. of mole of H_2O produced.=----------Cal / mol

LAB.EXP (5)

FACTOR AFFECTING REACTION RATE

(I.EFFECT OF CONCENTRATION)

PERFORMANCE OBJECTIVE

Upon completion of this laboratory experiment, the student technician will be able to verify the relationship between the rate of the reaction and the concentration of the reactant.

EQUIPMENT

1. Test tube
2. Graduated pipettes (10ml)
3. Stop watch

MATERIALS

1. Sodium thiosulphate solution of the following concentration : 0.05M , 0.1M ,0.15M, 0.2M, 0.25M and 0.3 M
2. Nitric acid solution (0.2M)

PROCEDURE

1. Transfer exactly 2.0 ml of 0.05 M sodium thiosulphate solution into one test tube by means of a pipette.
2. Into another test tube, transfer exactly 2.0 ml of 0.2M nitric acid.
3. Pour the test tube of acid into the test tube of thiosulphate. Mix well for one second and simultaneously start a stop watch.
4. Place the test tube against awritten paper and note the time required to obscure the writing on the paper. Record this time in seconds in your notebook.
5. Repeat the above procedure twice for each thiosulphate concentration. Record the time required for each experiment qand calculates the average time required for each concentration.

RESULTS

1. Record the time required for each experiment in second in table 1.
2. Calculate the average time required for each thiosulphate concentration.
3. Calculate the rate of the reaction as the reciprocal of reaction time and plot on a grah sheet the rate against concentration of sodium thiosulphate.

Run No.	$Na_2S_2O_3$ M	Reaction Time ,Seconds			Rate =1/t Second^{-1}
		Test I seconds	Test II seconds	Average Time (t) seconds	
1	0.05				
2	0.10				
3	0.15				
4	0.20				
5	0.25				
6	0.30				

LAB.EXP (6)

CHEMICAL TEST FOR ANION

PERFORMANCE OBJECTIVE

Upon completion of this laboratory experiment, the student technician will be able to perform different chemical tests to identify anions.

EQUIPMENT

1. Test tube
2. Droppers
3. Test tube holder
4. Test tube brush
5. Bunsen burner

MATERIALS

1. Sodium chloride solution (0.10M)
2. Sodium bromide solution (0.10M)
3. Sodium iodide solution (0.10M)
4. Sodium hydroxide solution (0.10M)
5. Sodium hydroxide solution (6M)
6. Sodium carbonate solution (0.10M)
7. Sodium sulfate solution (0.10M)
8. Silver nitrate solution(0.10M)
9. Ferrous sulfate solution (0.10M)
10. Sodium carbonate solution (0. 05M)
11. Sodium sulfide solution (0.01 M)
12. Nitric acid solution(2M)
13. Hydrochloric acid solution (1M)
14. Barium chloride solution (saturated)
15. Barium chloride solution(2M)
16. Sulfuric acid (concentrated)
17. Sodium nitrate solution(1M)
18. Ammonium nitrate solution(1M)
19. Lead nitrate moistened paper
20. Sodium sulfide solution(0.1M)
21. Ammonium molybdate solution
22. Nitric acid (concentrated)
23. Sodium bicarbonate solution
24. Magnesium sulfate solution
25. Potassium dichromate solution
26. Mercuric chloride solution
27. Ammonia solution(1M)
28. Strontium chloride solution
29. Diphenylamine solution

DISCUSSION

The salts which soluble in water consist of positive ions (cations) and negative ions (anions). In these experiments, the student will perform simple chemical tests to identify some of the common non-metallic negative ions (anions).

Acidic radicals (Anions) to be studied are classified into three groups as shown in the following table.

Group Number	Name of Group	Group Reagent	Acidic Radical (Anions)
I	Dilute Hydrochloric acid group	Dil. HCl	Carbonate CO_3^{2-} Bicarbonate HCO_3^- Sulphide S^{2-} Sulphite SO_3^{2-} Thiosulphate $S_2O_3^{2-}$ Nitrate NO_2^-
II	Concentrated Sulphuric acid group	Conc. H_2SO_4	Chloride Cl^- Bromide Br^- Iodide I^- Nitrate NO_3^-
III	Miscellaneous group	$AgNO_3$	Sulphate SO_4^{2-} Phosphate PO_4^- Borate $B_4O_7^{2-}$

GROUP I: Dil HCl group

Test	Carbonate CO_3^{2-}	Bicarbonate HCO_3^-
Solid salt + Dilute Hydrochloric acid	Effervescence and evolution of CO_2 gas indicate the presence of carbonate or bicarbonate .CO_2 gas may be detected by passing it through lime water which turbid lime water $Na_2CO_3 + 2HCl \longrightarrow 2NaCl + H_2O + CO_2$ $CO_2 + Ca(OH)_2 \longrightarrow CaCO_3 + H_2O$	Effervescence and evolution of CO_2 gas indicate the presence of carbonate or bicarbonate .CO_2 gas may be detected by passing it through lime water which turbid lime water $NaHCO3 + 2HCl \longrightarrow 2NaCl + H_2O + CO_2$ $CO_2 + Ca(OH)_2 \quad CaCO_3 + H_2O$
Salt solution + Barium Chloride ($BaCl_2$)	White precipitate formed $BaCl_2 + Na_2CO_3 \longrightarrow BaCO_3 + 2NaCl$	White precipitate formed on heating $BaCl_2 + NaHCO_3 \longrightarrow Ba(HCO_3)_2 + 2NaCl$
Salt solution + Silver nitrate ($AgNO_3$)	White precipitate formed $2AgNO_3 + Na_2CO_3 \longrightarrow Ag_2CO_3 + 2NaNO_3$	White precipitate formed on heating $2AgNO_3 + NaHCO_3 \longrightarrow AgHCO_3 + 2NaNO_3$
Salt solution +Lead Acetate $Pb(CH_3COO)_2$	White precipitate formed $Pb(CH_3COO)_2 + Na_2CO_3 \longrightarrow PbCO_3 + 2CH_3COONa$	White precipitate formed on heating $Pb(CH_3COO)_2 + NaHCO_3 \longrightarrow Pb(HCO_3)_2 + 2CH_3COONa$
Salt solution +Calcium Chloride ($CaCl_2$)	White precipitate formed $CaCl_2 + Na_2CO_3 \longrightarrow CaCO_3 + 2NaCl$	White precipitate formed on heating $CaCl_2 + NaHCO_3 \longrightarrow Ca(HCO_3)_2 + 2NaCl$
Salt solution +Magnesium Sulfate ($MgSO_4$)	White precipitate formed $MgSO_4 + Na_2CO_3 \longrightarrow MgCO_3 + Na_2SO_4$	White precipitate formed on heating $MgSO_4 + NaHCO_3 \longrightarrow Mg(HCO_3)_2 + Na_2SO_4$
Salt solution +Mercuric Chloride($HgCl_2$)	Reddish brown precipitate formed $4HgCl_2 + Na_2CO_3 \longrightarrow Hg_4O_3.CO_3 + 8\ NaCl + 3CO_3$	Reddish brown precipitate formed on heating $HgCl_2 + NaHCO_3 \longrightarrow Hg(HCO_3)_2 + 2\ NaCl$

Test	Sulphide S^{2-}	Sulphite SO_3^{2-}	Thiosulphate $S_2O_3^{2-}$
Solid salt + Dilute Hydrochloric acid	H_2S gas evolved with rotten egg smell. $Na_2S + 2HCl \longrightarrow 2NaCl + H_2S$	H_2S gas evolved with pungent smell. It turn filter paper with acidified dichromate to green $Na_2SO_3 + 2HCl \longrightarrow 2NaCl + H_2O + SO_2$ $K_2Cr_2O_7 + SO_2 + H_2SO_4 \longrightarrow K_2SO_4 + Cr_2(SO_4)+4H_2O$	SO_2 gas evolved with pungent smell. Solution turns yellowish white due to formation of colloidal sulfur. $Na_2S_2O_3 + 2HCl \longrightarrow 2NaCl + H_2O + SO_2 + S$
Salt solution + Silver nitrate ($AgNO_3$)	Black precipitate formed $2AgNO_3 + Na_2S \longrightarrow Ag_2S + 2NaNO_3$	White precipitate formed $2AgNO_3 + Na_2SO_3 \longrightarrow Ag_2SO_3 + 2NaNO_3$	White precipitate formed $2AgNO_3 + Na_2S_2O3 \longrightarrow Ag_2S_2O_3 + 2NaNO_3$
Salt solution +Lead Acetate [$Pb(CH_3COO)_2$]	Black precipitate formed $Pb(CH_3COO)_2 + Na_2S \longrightarrow PbS + 2CH_3COONa$	White precipitate formed $Pb(CH_3COO)_2 + Na_2S0_3 \longrightarrow PbS0_3 2CH_3COONa$	White precipitate formed $Pb(CH_3COO)_2 + Na_2S_20_3 \longrightarrow PbS_20_3 + 2CH_3COONa$ $PbS_20_3 + H_2O \longrightarrow PbS + H_2SO_4$
Salt solution + Sodium Nitroprusside $Na_2[Fe(CN)_5(NO)]$	Purple color formed $Na_2[Fe(CN)_5(NO)] + Na_2S \longrightarrow Na_4[Fe(CN)_5(NOS)]$	----------	----------
Salt solution +Cadmium Sulphate ($CdSO_4$)	Yellow precipitate formed $CdSO_4 + Na_2S \longrightarrow Na_2SO_4 + CdS$	----------	----------
Salt solution + Potassium permagnate($KMnO_4$)	----------	Purple color disappearance $5Na_2S0_3 + 3KMnO_4 + 3H_2SO_4 \longrightarrow 2MnSO_4 + 5Na_2SO_4 + 3H_2O + K_2SO_4$	Purple color disappearance $5Na_2S_20_3 + 3KMnO_4 + 3H_2SO_4 \longrightarrow 2MnSO_4 + 5Na_2SO_4 + 3H_2O + K_2SO_4$
Salt solution + Potassium Dichromate ($K_2Cr_2O_7$)	----------	Purple color disappearance $3Na_2S0_3 + 3K_2Cr_2O_7 + 8H_2SO_4 \longrightarrow 2Cr(SO_4)_3 + 3Na_2SO_4 + 3H_2O + K_2SO_4$	----------
Salt solution + Barium Chloride ($BaCl_2$)	----------	----------	White precipitate formed $BaCl_2 + Na_2S_20_3 \longrightarrow BaS_20_3 + 2NaCl$

Test	Nitrate NO_2^-
Solid salt + Dilute Hydrochloric acid	A brown fumes of nitrogen oxide are formed $Na_2NO_2 + 2HCl \longrightarrow 2NaCl + NO + NO_2$
Salt solution + Silver nitrate ($AgNO_3$)	White precipitate formed $AgNO_3 + NaNO_2 \longrightarrow AgNO_2 + NaNO_3$
Salt solution + Potassium permagnate($KMnO_4$)	Purple color disappearance $5NaNO_2 + 2KMnO_4 + 3H_2SO_4 \longrightarrow 2MnSO_4 + 5NaNO_3 + 3H_2O + K_2SO_4$
Salt solution + Ferrous Sulfate($FeSO_4$)	A brown ring formed. $2NaNO_2 + 2\ FeSO_4 + 3H_2SO_4 \longrightarrow Fe(SO_4)_3 + 2NaHSO_4 + 2H_2O + 2NO$ $NO(g) + FeSO_4 \longrightarrow [Fe(NO)]SO_4$
Salt solution +Diphenylamine	Blue color formed.

LAB.EXP (7)

CHEMICAL TEST FOR ANION

GROUP II&III

GROUP II:Conc. Sulphuric Acid (H_2SO_4)

Test	Chloride Cl^-	Bromide Br^-
Solid salt + Conc. Sulphuric Acid (H_2SO_4)	HCl gas evolved which detected by forming white fumes with NH_4OH $2NaCl + H_2SO_4 \longrightarrow 2HCl + Na_2SO_4$	Reddish brown fumes of Br_2 $NaBr + H_2SO_4 \longrightarrow 2HBr + Na_2SO_4$
Salt solution + Silver nitrate ($AgNO_3$)	White precipitate formed $AgNO_3 + NaCl \longrightarrow AgCl + NaNO_3$	Pale yellow precipitate formed $AgNO_3 + NaBr \longrightarrow AgBr + NaNO_3$
Salt solution +Lead Acetate [$Pb(CH_3COO)_2$]	White precipitate formed $Pb(CH_3COO)_2 + NaCl \longrightarrow PbCl_2 + 2CH_3COONa$	White precipitate formed $Pb(CH_3COO)_2 + NaBr \longrightarrow PbBr_2 + 2CH_3COONa$
Salt solution +Magnesium dioxide and Conc. H_2SO_4	Cl_2 gas evolves which detected by its yellowish green color $2NaCl + MnO_2 + 2H_2SO_4 \longrightarrow MnSO_4 + Na_2SO_4 + 2H_2O + Cl_2$	Br_2 gas evolves which detected by its reddish brown color $2NaBr + MnO_2 + 2H_2SO_4 \longrightarrow MnSO_4 + Na_2SO_4 + 2H_2O + Br_2$
Salt solution + Carbon disulphide	----------	Carbon disulphide layer turns orange

Tet	Iodide I^-	Nitrate NO_3^-
Solid salt + Conc. Sulphuric Acid (H_2SO_4)	Violet fumes of I_2 are evolved $2NaI + H_2SO_4 \longrightarrow 2HI + Na_2SO_4$ $4HI + O_2 \longrightarrow 2I_2 + 2H_2O$	Reddish brown vapor of NO_2 gas are evolved $4NaNO_3 + H_2SO_4 \longrightarrow 4NO_2 + O_2 + 2NaSO_4 + 2H_2O$
Salt solution + Silver nitrate ($AgNO_3$)	yellow precipitate formed $AgNO_3 + NaI \longrightarrow AgI + NaNO_3$	----------
Salt solution +Lead Acetate [$Pb(CH_3COO)_2$]	Yellow precipitate formed $Pb(CH_3COO)_2 + NaI \longrightarrow PbI_2 + 2CH_3COONa$	----------
Salt solution +Magnesium dioxide and Conc. H_2SO_4	I_2 gas evolves which detected by its violet color $2NaI + MnO_2 + 2H_2SO_4 \longrightarrow MnSO_4 + Na_2SO_4 + 2H_2O + I_2$	----------
Salt solution + Carbon disulphide	Carbon disulphide layer turns violet	----------
Salt solution +Mercuric Chloride($HgCl_2$)	Red precipitate formed $2NaI + HgCl_2 \longrightarrow HgI_2 + 2NaCl$	----------
Salt solution + copper sulphate $CuSO_4$	Brown precipitate formed $CuSO_4 + 4KI \longrightarrow Cu_2I_2 + I_2 + 2K_2SO_4$	----------
Salt solution + Diphenylamine	----------	Blue color ring at the interface of the two liquid phases formed

Brown ring test	----------	Brown ring formed $2NaNO_3 + 6\ FeSO_4 + 4H_2SO_4 \longrightarrow 3Fe_2(SO_4)_3 + 3Fe_2(SO_4)_3 + Na_2SO_4 + H_2O + 2NO$

GROUP III: Miscellaneous Group

Test	Sulphate SO_4^{2-}	Phosphate PO_4^{-}	Borate $B_4O_7^{2-}$
Salt solution + Silver nitrate ($AgNO_3$)	White precipitate formed $2AgNO_3 + Na_2SO_4 \longrightarrow Ag_2SO_4 + 2NaNO_3$	Canary yellow precipitate formed $2AgNO_3 + NaHPO_4 \longrightarrow 3AgHPO_4 + 2NaNO_3$	Canary yellow precipitate formed $4AgNO_3 + Na_2B_4O_7 + H_2O \longrightarrow 4AgBO_2 + 2NaNO_3 + 2HNO_3$
Salt solution + Barium Chloride ($BaCl_2$)	White precipitate formed $BaCl_2 + Na_2SO_4 \longrightarrow BaSO_4 + 2NaCl$	White precipitate formed $BaCl_2 + NaHPO_4 \longrightarrow BaHPO_4 + 2NaCl$	White precipitate formed $2BaCl_2 + NaB_4O_7 + H_20 \longrightarrow Ba(BO_2)_2 + 2NaCl + 2HCl$
Salt solution +Lead Acetate [$Pb(CH_3COO)_2$]	White precipitate formed $Pb(CH_3COO)_2 + Na_2S0_4 \longrightarrow PbS0_4 + 2CH_3COONa$	----------	----------
Salt solution + Strontium Chloride ($SrCl_2$)	White precipitate formed $SrCl_2 + Na_2S0_4 \longrightarrow SrSO_4 + 2NaCl$	----------	----------
Salt solution + Ferric chloride ($FeCl_3$)	----------	Yellowish white precipitate formed $NaHPO_4 + FeCl_3 \longrightarrow FePO4 + HCl + 3NaCl$	----------
Salt solution + Ammonium Molybdate [$(NH_4)_2MoO_4$]	----------	Yellowish precipitate formed $NaHPO_4 + 12(NH_4)_2MoO_4 + 23HNO_3 \longrightarrow (NH_4)_3[P(Mo_{12}O_{14}] + 2NaNO_3 + 21NH_4NO_3 + 12H_2O$	----------
Salt solution +Mercuric Chloride($HgCl_2$)	----------	----------	Reddish brown precipitate formed $2HgCl_2 + Na_2B_4O_7 + H_20 \longrightarrow 2Hg(BO_2)_2 + 2NaCl + 2HCl$